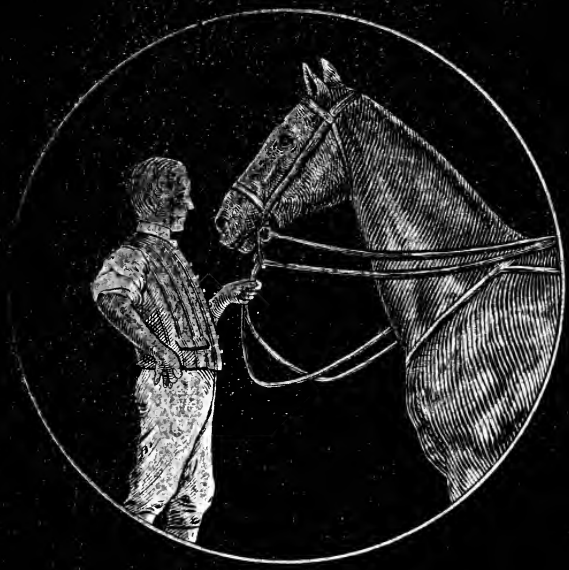
The Practical Horse Keeper



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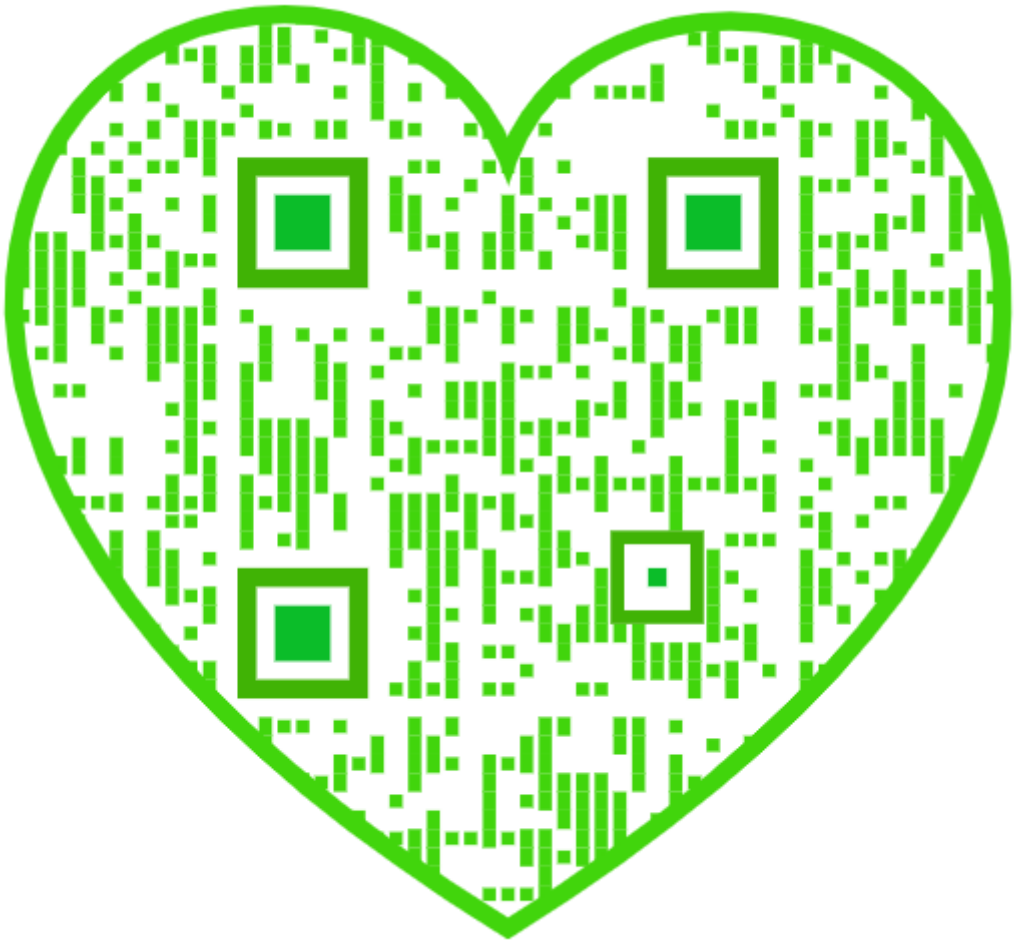

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THE

PRACTICAL HORSE KEEPER.

BY

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PREFACE.

THIS little work is intended as a guide to those who have to do with horses, either as owners, purchasers, breeders, trainers, managers, or attendants, and whose experience has not been so extensive as those on whose knowledge it is based. There is no pretence whatever to novelty in any of the subjects treated; but it is to be hoped that such absence of novelty will not detract from utility, and that the hints contained in its pages may be found of service, and assist those who are interested in horses and horse management when they require assistance.

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THE

PRACTICAL HORSE KEEPER.

CHAPTER I.

BREEDS OF HORSES: THEIR POINTS, PROBABLE COST, ETC.

THE great variety in the breeds of horses in this country is always an intricate and difficult study, so much is it complicated by "cross-breeding," which, though sometimes conducted on reasonable and well-established principles, is only too often carried out on no principle at all, but in a sort of haphazard fashion that may result in something good and definite, but more frequently produces an undefinable and unsatisfactory progeny, the special adaptability of which for special work cannot easily be arrived at.

But for classification or grouping, according to the services which they are best adapted to render, horses are conveniently classed in two divisions—saddle and draught; and these divisions are again subdivided into (1) racer, hunter, hack, or roadster; and (2) carriage and light draught horses, and agricultural and heavy draught horses.

As race horses do not enter into the category of general utility horses, we will not include them in our notice of these subdivisions; though it must not be inferred that they are of no service. On the contrary, when race horses are bred and reared with the object of improving the breed of the entire first subdivision alluded to above, then their value can scarcely

be over-estimated; but when they are produced merely to serve as objects with which to gamble, merely for speed for short distances, with light weights on their backs, and not to exhibit strength and endurance—qualities so necessary in other horses —then they are of comparatively little value.

THE HUNTER.

There can be no doubt that a perfect hunter should be a perfect horse, combining in himself the qualities of speed, strength, endurance, and good temper; with excellent action, to ensure safety and certainty in going over broken ground, and in overcoming high or wide obstacles. In outline and build, as a whole and in detail, his conformation should be faultless, and that which secures velocity, vigour, stability, and promptitude in movement; while his intelligence and docility should be highly developed, and be associated with that very precious characteristic of a well-trained horse—a good mouth.

As has often been remarked, there is little difficulty in buying what is called a "made hunter," if the buyer has the money and is willing to expend it in obtaining such an animal. But though a "made hunter" can be bought, and, indeed, is so in the great majority of instances, yet it not unfrequently happens that, notwithstanding his jumping and galloping qualities being all that are desirable, he has a "hard mouth," and is not easily controlled in the hunting field. So serious is this fault sometimes, that a horse otherwise an excellent hunter is positively dangerous. When in view of a fence, for instance, he will seize the bit between his jaws and rush wildly at the obstacle at the rate of twenty miles an hour, in spite of his rider's attempts to moderate his pace and steady him. Well may a hunting man exclaim: I should like to know what *pleasure* can be derived from riding such a brute! It takes all a man can do to moderate the animal's pace; it requires two

hands on the reins to turn him from side to side; and the rider has the pleasant prospect, in the event of a mistake at a fence, of his horse not being able to recover himself, the almost inevitable "spill" being the result. Besides, his mount requiring all his attention, he is quite unable to enjoy the hunting; that is to say, he is unable to watch the working of the hounds, and his day's hunting (so-called) is really nothing more than a modified steeple-chase, with none of its accompanying pleasures.

As has been said, a perfect hunter is a perfect horse; and he may be of various degrees of breeding—quite thorough-bred, nearly so, or half-bred. It is difficult to obtain a thorough-bred competent to carry more than twelve stone; but under that weight, in counties where pace counts for much, and the fences are not too close—as in Northamptonshire and Leicestershire—there can be no doubt that, if he possesses the other necessary qualities, and price is not an obstacle, a thorough-bred is the best. Breeding in the hunter is very necessary, and, provided the country is open, there can scarcely be too much of it; but over twelve or fourteen stone, and especially in a close or cramped country, a three-parts or half-bred horse is to be preferred, as he can be obtained larger and stronger, and better adapted for difficult and frequent jumping than the thorough-bred. His less excitable temperament conduces to this end; while the thorough-bred, unless exceptionally formed, is not good for going over rough ground and high obstacles, his breeding and training through many generations being with the view to high speed on level ground.

The various definitions of a hunter all tend to show that he is not an easy horse to find, if he is to possess all that is considered necessary to establish his claim. One of these descriptions gives him the outline and shape of a cob, the spirit and blood or breeding of a race horse, the size and scope of a carriage horse, and the manners and action of a park hack.

A good, high, and sloping shoulder is absolutely essential in a hunter, and no less are good limbs and joints; but the first, being that conformation which is most necessary, is that which is always so eagerly sought for. It is often the point which is most difficult to obtain, from the fact that more frequently than not, one of the parents has had heavy or upright shoulders, and these are reproduced in the foal—either the thorough-bred sire or the harness mare to which he is put having had this drawback. The hunter's loins and hind quarters should be wide and strong, and thighs long and muscular; while his "wind" should be without check or stint. It is scarcely necessary to add that a hunter should be stout-hearted at work and after it; he ought always to feed well and rest well, and give other indications of a good constitution and a placid temperament.

Made-hunters of first-class quality and appearance are expensive to purchase, especially if they are up to weight; and two, three, or four hundred guineas are sometimes paid for them. But good half-bred horses may be bought for much less, and especially from farmers who breed and ride them straight to hounds.

THE HACK.

There are three or four kinds of hacks in use—the road hack, cover hack, park hack, and lady's hack.

The *road hack* is a much rarer animal now than he was before the days of railways, telegraphs, and steamships, when much of the travelling of those days was done on his back, and when his best qualities were most fully developed. Road riding is not now very common, and journeys on horseback are seldom indulged in; consequently, the decrease in the number of road hacks has been very great, and the qualities which were so conspicuous in them are not now so much in request. This is a matter to be regretted, and especially on the score of cavalry

remounts, since, owing to the greatly diminished demand for these roadsters, comparatively few are bred; and as they constituted an excellent source for the supply of cavalry, this arm is now mounted with the greatest trouble, and at a much higher rate than formerly. A good road hack was the type of a good troop horse.

Such a horse should stand from fifteen hands to fifteen hands two or three inches; he ought to be able to walk at the rate of four miles an hour, and to trot from eight to twelve, or even fourteen miles in the same time. His action should be easy, true, and level; neither too high—which would be fatiguing on long journeys, as well as damaging to legs and feet—nor yet too low, for then he would be liable to stumble, or even fall, especially in travelling over uneven roads, and particularly when tired.

In order to ensure good action, as well as to guarantee the necessary amount of strength, the road hack in make and shape should be, like the hunter, as near perfection as possible in all those points which are necessary to this end. The requirements to be met are, therefore, somewhat numerous, if a typical animal is to be secured, and they have been enumerated as follows:—The head should be small and fine, broad between the eyes and between the branches of the lower jaw at their angles; also the distance from the eye to the angle of the lower jaw should be great. The nostrils should be large, wide, clean, and well-defined; the mouth small, with the lips thin and firm. The ears should be small, fine, and pointed, being carried firmly, with their tips inclining slightly inwards towards each other; while the eye should be large, full, and prominent, with well-developed eyebrow. The neck must be long, somewhat thin, and fit well into the space formed between the branches of the lower jaw—being longer on its upper than its under surface, as well as being convex on its superior border. The head should be well "set on" to the neck, which,

if the jaws are wide and the neck of the proper conformation, will be the case, and will assist very materially in giving to the horse what is called a "good mouth." The withers must neither be too fine, thick, or low; a fine wither, well covered with muscle, and yet not loaded, is considered perfection. The mane should be fine, silky, and not too abundant. The shoulder-blade must be long and oblique, not vertical; neither must it be coarse and prominent, but should blend gradually into the withers and back. A coarse, thick shoulder should always be avoided, as should also a very fine one, which leaves the withers standing up in a thin ridge like a ploughshare; for an animal with such shoulders will soon become fatigued, owing to the insufficient muscular development of these parts. The long, oblique shoulder gives plenty of space before the rider, the saddle sits well, provided the "girth" of the chest is also deep, and the action is pleasant. But if the shoulder be straight or short, or a combination of the two, the saddle will be too forward; and when the horse stumbles, as he is almost sure to do from defective action due to this faulty conformation, he runs the chance of falling, breaking his knees, and perhaps the neck of his rider as well.

The chest should be deep and moderately wide, both conditions being essential to the full development of the functions of the heart and lungs. The fore-arm must be long in proportion to the leg, that is, the greater length in proportion must be above the knee, and the less below it the better; the muscular development of the fore-arm should be as great as possible. The elbow, in addition, should be long and prominent, not turned in, but be clear of the chest. The knee should be large, wide, and prominent, but should appear more or less broad and flat when looked at in front, while the bone behind should be long and project well backward. "Calf knees" (those which incline backwards), "buck knees" (those inclining towards each other), and those inclining forwards, should always be avoided.

The cannon or shank-bone should be as strong and short as possible, and perfectly straight, being neither curved forwards, backwards, or sideways; the tendons behind this bone should stand well out and away from it, which is the case when the bone behind the knee is well developed and prominent. The space between these tendons and the bone should be well defined, and rather depressed, but if it is filled up the leg will appear round and puffy, instead of being flat and broad laterally; such legs are designated "gummy."

The fetlock joint should be large and flat laterally, the back part being clean and prominent. The pastern bones should neither be too long, short, oblique, or vertical. If the pastern is long it is necessarily very oblique, and therefore weak; if short it is upright, and therefore predisposed to ringbones, windgalls, navicular disease, etc.; besides causing the horse to be rough and unpleasant to ride.

The pastern joint should be well developed and strong. The feet, as regards size and shape, should be neither too large nor too small; the slope in front should be between 50° and 52° angle with the ground; the sole should be moderately concave, the frog large, strong, and sound; while the whole hoof should be tough, sound, and not brittle.

The back of the roadster should be rather straight, and not too long, a hollow or concave back being objectionable on account of its weakness; while a convex or "roach" back, though generally strong, makes a horse unpleasant and rough to ride. The ribs should be long and oval, and they should continue to be so as far as the very last rib, while the space between this and the point of the hip should be easily covered by the breadth of the hand. The hind quarters must be long, deep, full, and broad, as well as straight from the back to the tail; the distance from the point of the haunch to the hocks should be great, the stifles prominent, and from there to the hocks large and full. The hocks themselves should be large

and fine, without being coarse or puffy; the point of the hock ought to be prominent, and the leg below it incline very slightly under the body, but it should not be too perpendicular, nor deviate laterally from the perpendicular, or, in other words, it should not be "wide behind," or "cow-hocked." Those parts below the hocks may be compared with the description of those below the knee. With regard to the tail, this should pass in a straight line from the croup, and then droop in a graceful curve.

Such is the description of the roadster, and it is applicable more or less to the hunter and the troop horse, when these make any approach towards perfection.

The price of a good roadster will vary with his shape, size, and qualities, and may extend from thirty or forty pounds to eighty or a hundred pounds, but for a useful animal probably the mean between the two extremes is sufficient.

The *cover* or *covert hack* differs but little from the roadster except in height, which is from fourteen to fifteen hands high; and he should be capable of carrying his rider at a trot at the rate of twelve or thirteen miles an hour, canter fifteen or sixteen miles an hour, or gallop twenty; he should also be nimble enough to jump a ditch, a fallen tree, or a low fence. His pace should be easy and elastic, his walk free and true, without any tendency to tripping or stumbling in front, or knuckling-over behind. Such an animal must be well-shaped, and it must be confessed that a perfect covert hack is nowadays far more difficult to procure than a perfect hunter; but there are many which, though far from perfect, yet do most excellent service.

For light-weight carrying, that is, for anything under fourteen stone, such a hack may be nearly, if not quite thoroughbred; but if to carry a heavier weight, then he must be a stout cob.

The price of a covert hack will depend upon quality, size,

and symmetry, but it should average something like that of the roadster. Fifty pounds would not be too much for a tolerably perfect one to carry a light weight; for a stout one to carry a heavy weight, more money would have to be given.

The *park hack* should be something like the covert hack, but with more style and show, as he is not so much for work as for display. His height may be from fifteen to sixteen hands, and his walk, trot, and canter should be easy and graceful, while his temper and mouth should be good in every way. "He must be intelligent (amongst horses senseless brutes are legion), for without intelligence, even with fine form and action, he can never be pleasant to ride. Thorough-bred is to be preferred, and if not quite, as nearly thorough-bred as possible. He may be of any colour except mealy or foul marked; white marks often much improve, but they also sometimes quite disfigure a horse. The head should be of the finest Oriental type; the neck well arched, but not too long; the shoulders light at the points, long, and well grown into the back. The loins should be accurately arched, and the quarters level and nicely rounded—not drooping abruptly toward the tail (like many capital hunters, famous race-horses, and useful road hacks). The mane and tail should be full, straight, without the least suspicion of a curl, and every hair as soft as silk; four clean, well-shaped, well-placed legs, the fetlocks rather longer than would be chosen for a hunter; from such a form, action pleasant to the rider may be confidently expected, and paces agreeable for even the commonest observer to follow. The walk of a park hack should be perfection—fast, springy; the legs moving, as it were, independently of the body, without apparent exertion, with all the certainty of machinery, the head carried in its right place, the neck gracefully curved, and the tail displaying a full flag gracefully keeping time with the foot-falls. From the walk he should be able to bound into

any pace, in perfectly balanced action, that the rider may require."

A park hack, perfect in symmetry, manners, and paces, will bring a high price, say from a hundred to three hundred pounds, or even more. But over one hundred pounds the price is a fancy one, and will depend upon many circumstances, the most important of which is, doubtless, the long purse of the purchaser.

The *lady's hack*, like the park hack, should be perfect in conformation, paces, mouth, and temper. The back should be rather longer than in the gentleman's hack, the head well placed and carried on a rather long neck, and the shoulder at a good angle. The animal should be particularly sound and strong on his fore legs; no woman should be put on a stumbling horse, or one with weak fore limbs. Pasterns rather more oblique than usual are not a disadvantage in a lady's hack; on the contrary, like the long back, they make the pace more elastic, and therefore pleasanter.

The price of a lady's hack, like that of the park hack, varies within wide limits, according to breeding, style of going, temper, conformation, etc., as well as the means and fancy of the intending purchaser. So that while a useful animal may be purchased for forty or fifty pounds, one of perfect manners, good shape, and attractive colour, may reach three figures.

Closely allied to hacks come what are called *cobs*, which range widely in style, qualities, and price, according as they are park cobs, weight-carrying cobs, ordinary cobs, harness cobs, etc.

The cob proper is described as of two kinds: one, the priceless animal of grand symmetrical form, short legs, a round barrel, well ribbed-up; a well-bred intelligent head, a neck beautifully set on and carried, and a tail to match—in a word, he should possess the strength of a dray horse, the spirit of a race

horse, the manners of a perfect gentleman, and at least two good paces, both easy—a square walk over four miles an hour, and a square trot of eight miles an hour—or a very slow canter, performed quite on the haunches. With these merits, a cob of a proper sober colour is worth at least two hundred guineas to a dealer, and to the dealer, when a heavy-weighted millionaire comes to him in despair, any price he chooses to ask. No less a sum than £400 has been given for a perfect cob fit to carry a rider weighing seventeen stone. But such cobs are the few and far between exceptions—more difficult to find than even a heavy-weight hunter, because they are only bred by chance, as it were; though there is no reason why they should not be bred with some degree of certainty.

It has been remarked, that the vulgar idea of a cob is a diminutive cart-horse, and that such, even if without action, but if very fat and not absolutely hideous, are constantly sold to ignorant people with plenty of money in their pockets, at double their worth, because they fancy that thick legs (perhaps carefully shaved) and a fat body imply strength. One of the best tests recommended for a weight-carrying cob is to try if he can walk down a steep hill with a heavy weight on his back, and a loose rein.

The second kind of cob, the ordinary sort, if he is sound, has substance, can carry fourteen stone, move at a fair pace, with useful though not showy action, and will go in harness, should be worth a price ranging between £50 and £100.

Cobs, as distinguished from park hacks, are of the generally useful class, so-called because of their weight, which enables them to pull a loaded carriage.

It is supposed to be a disadvantage to a saddle cob to have been in harness, for it is said that those riders who are fastidious will not, if they know it, buy one that has ever been in a collar; but, as has been also noted, since such animals are, in nine cases out of ten, bred by chance, and work their way

by degrees into good society, after graduating in bakers' or butchers' carts, there is every probability of their being accustomed to the collar, even if they do not bear the marks which so frequently attend its use. Indeed, harness appears to be "the badge of all their tribe." Mention is made of a cob, fourteen hands three inches high, five years old, and rather plain than otherwise, which won a leaping prize at one of the Agricultural Hall shows, and was sold for eighty guineas, to a heavy-weight financier who intended to use the animal as a "constitutional" park hack, notwithstanding a collar blemish; a year later the cob was sold at a profit.

The ordinary cob is a most useful animal, either in saddle or harness, and may be looked upon as the "horse of all work," either in large or very limited studs, and especially for household work.

Next to the cob for usefulness comes the pony, especially in an establishment where there are children; but of this animal we will treat hereafter.

CARRIAGE AND LIGHT DRAUGHT-HORSES.

These useful animals are of various degrees of utility, quality, and consequently cost. Pair-carriage horses, if well matched in size, pace, and colour, and in their way of first-class quality, will bring a large price—say from two to four or five hundred pounds.

The size of carriage horses will depend upon their work, or rather upon the size of the vehicles they are required to draw; so that we have them measuring from fourteen to sixteen and even seventeen hands high.

The barouche is always a *pair-horse* carriage, as is also the landau and the brougham, unless these are specially adapted for a single horse. Such horses are generally half-bred, and are chiefly reared in Yorkshire, Lincolnshire, and Shropshire;

they are, as a rule, the produce of the thorough-bred horse and agricultural or cart mares, the best of these belonging to the now somewhat rare Cleveland breed. Many of them have been bred for weight-carrying hunters, but have not turned out sufficiently good or fitted for that purpose, though they often realise nearly as good prices if well matched. The best colours are bay, either dark or light, and brown (and especially dappled); chestnut is not so common, and does not appear to be so much sought for, neither is grey.

It is generally recognised that a good horse for double harness in these carriages should be lengthy, and yet have a tolerably short back, with oblique and muscular shoulders, long, straight, and strong quarters, strong hocks, and good fore-limbs and feet. The obliquity and shape of the shoulder is not so important in harness as in saddle horses; nevertheless, if they are to have safe and good action, the shoulders must be well formed and placed, as a good forehand is essential in a harness horse, both for appearance and action; the latter, it is needless to remark, should be easy and free, both in knee and hock.

A neat head and long gracefully curved neck are likewise to be looked for, as well as a deep girth, round body, and ribs carried well back.

The height, as has been said, will depend upon circumstances, but sixteen hands, or a little over, is the usual size; when he measures seventeen hands, the horse is often long-backed, long-legged, and gaunt-looking.

For *single harness*, in a landau or brougham, it may be necessary to have a horse a trifle heavier and stronger than for double harness, but this will depend on the size and weight of the carriage. A first-class brougham horse is a valuable animal; he should be long and low, well-bodied, and from fifteen and a half to sixteen hands high, according to the height of the fore-wheels of the carriage; for it is important that the horse

should match the carriage, as if he is too small he looks overweighted (even if strong enough), and if too tall the carriage looks out of proportion, and the horse is lifting up the weight instead of drawing it horizontally. He should have a broad chest, a lofty crest, a broad back (if rather hollow it is no objection), a flowing mane, a full and well-carried tail, and present a combination of breeding and power, with grand and stately action all round; and though only supposed to travel at the rate of eight miles an hour, he should be within his pace at eleven or twelve miles. Such a horse fetches a high price in the dealer's hands, and especially if the action of the animal be what is termed "grand"; the price may then be what is designated "fancy," and rise high in the three figures.

For lighter carriages, such as the wagonette, dog-cart, Victoria phaeton, etc., a lighter and better bred horse is more suitable. The height here again will depend on the size of the carriage, and may run from fifteen hands one or two inches to sixteen hands. Good conformation and action are, of course, essential, with a fair amount of speed. Sound forelegs and hocks are not to be neglected in this description of horse, the price of which may vary from £25 or £30 to £80 or £90. The best of the class are generally found in Norfolk, which produces good steppers, with strength and just proportions.

The omnibus, van, and trader's horse is to be found in many parts of the country, and varies in size and quality more than perhaps any other kind of horse. He generally has but little breeding—a half-bred mare and a cart-horse sire being usually the pedigree of the great majority of van and omnibus horses. Light agricultural horses—such as those bred in many parts of Wales—come in very useful for this kind of work, and are largely used. The chief objection to them is the coarseness of their legs, which are very hairy, and their hoofs are often large. The price is from £25 to £50.

AGRICULTURAL AND HEAVY DRAUGHT-HORSES.

These, after all, are the most important kinds of horses in agricultural and trading countries, and their value from an economical point of view cannot be disputed. Of late years great attention has been paid to their improvement, and particularly to the breeds known as Clydesdale and Shire horses.

The *Clydesdale* horse is, though comparatively large, more active and handy than the Shire horse, and is, therefore, more used where strength and speed are required in combination. He shows more breeding than any other of the cart-horse kind, and his type is more fixed and definite. The prevailing colours are bay and brown; black and grey are less common. His height is about sixteen hands, or a few inches more, and his breeding is manifested in the neat, handsome head, good forehead, and symmetrical body, which is deep in the girth, round, and short. The legs are short and muscular, with large bones; formerly the legs were rather long, but this defect has been corrected by judicious breeding. The hair on the back part of the legs, toward the fetlocks, is made a special feature in this breed; at one time it was curly, but now the fashion is to have it long, straight, and silky. The face and legs are often white, which rather detracts from their otherwise comely appearance.

A noted Clydesdale belonging to Colonel Lloyd, of Lockinge Park, Berkshire, measured seventeen hands high, seven feet six inches in girth, eighteen inches round the fore-arm, and ten and a half inches below the knee.

The value of good Clydesdale horses is remarkably high, the prices given for them, even when yearlings, being greater sometimes than for many thorough-bred race-horses of distinguished pedigree. It is not at all uncommon for stallions to fetch £500, and even more; indeed, we are informed that

thorough-bred Clydesdale sires have been let out for the season for £500.

The *Shire* horse is described as a true cart-horse which is not a Clydesdale, a Suffolk Punch, or a dray-horse, but is at times a blood relation of all three. He appears to be of no particular stamp, colour, or breed, but a mixture of choice county horses, resulting in a large, well-built, powerful animal, more placid and stronger than the Clydesdale, though less valuable as a sire, inasmuch as he is less certain in transmitting his good qualities. Moreover, his pace is slower, and he does not excel in anything beyond a smart walk.

The head is generally large and heavy, without expression, though showing good temper; the body is large and roomy, some horses girthing eight feet; the hips wide, and the loins broad and muscular; the fore-arms and thighs are long and powerful, and the hocks broad and deep. The legs are very hairy, the hair (which should be rather silky) falling thickly over the hoofs.

The largest of these horses are bred on heavy land, where plough work is very exacting; and the strongest and best-looking of them are selected for drawing heavy loads at a comparatively slow pace in towns. It is stated that on a moderately good hard road one of these horses will take two tons as his ordinary load; while nothing will equal them in starting and shifting railway waggons. "Less handsome specimens are purchased for road waggons. The mild temper of these horses adapts them admirably for large teams, where a long waiting pull is required, or to guide good-temperedly to the voice or whip, without rushing into the collar, as hotter-tempered horses are so prone to do. Three of these brood mares can take a double-furrow plough even through heavy, stiff land, and they are taught more easily than any other horse to go gently, and stop at roots in wood land, or amongst other obstacles."

The *dray-horse* might be truly designated a Shire horse, as he is bred in Lincolnshire, Berkshire, Oxfordshire, Wiltshire, Herefordshire, and Yorkshire. He is usually an immense beast—a mammoth horse, in fact, "slow, ponderous, and stately, weighing from fifteen hundredweight to a ton, and standing from seventeen to nineteen hands high, capable of drawing and backing—a pair of them—from three to four tons in a two-wheeled dray, and from six to seven tons in a four-wheeled one when three or four of them are yoked in it." Their colours are various; those held in most esteem are perhaps red and blue roans.

The *Suffolk Punch* or cart-horse is not much in use out of that county, and has changed much of late years. Formerly he was about fifteen hands high, short and compact in build, with thin legs, and low, thick shoulders. The colour was always chestnut, running through five shades—from light sorrel to dark chestnut. Now, however, he is bred larger—from fifteen hands two inches to sixteen hands, but the colour is the same. The popular notion is that, though excellent for farm labour, he does not do well at road work; but nevertheless, for harness, when he is well-shaped and a good stepper, he realises a large price.

Considering the large and important share draught-horses take in labour, and that they are perhaps more profitable to breed than any other kind of horse, a most essential point to bear in mind in their production is their freedom from hereditary defects and predisposition to disease, and especially such as will militate against their usefulness. Soundness in them is of much moment, and particularly soundness in wind, legs, and feet. It is in the two latter that these horses most frequently fail.

Next to soundness, as Reynolds observes, and far more desirable than perfect symmetry, is the possession of good action; for without it an otherwise excellent animal is

incalculably depreciated in both value and usefulness. Good and true action is very frequently, but not invariably, associated with perfect symmetry; but the possession of it may be accepted as evidence of fairly equal conformation; for defective or slovenly action can only arise in a sound animal from an unequal distribution of physical power, or from want of stamina or pluck. In many horses, good bold action is an evidence of power, and the heavier the horse the better he should move in both walk and trot.

An educated ear can distinguish a horse possessing good action, the same writer truly remarks, when the animal is travelling on a hard road, by the regular succession of sonorous thumps made by its feet—one, two, three, four. In a walk, which is essentially the draught-horse's pace, each of the four feet should be brought down perfectly flat—the heels, toes, and quarters reaching the ground at the same instant, the fore ones with the toe and heel in a line with the body, neither turned in nor out, the hinder ones perhaps slightly turned out. Straight and full extension of the fore limbs is desirable, rather than excessive elevation of the feet by high knee and shoulder action. The movement of the hind extremities should be free and loose, the feet being carried far under the body by perfect flexion of the hocks, which, in advancing, should, in turn, have a slightly inward tendency; while the toe, at the same time, should be as slightly turned outwards. Defective and wide hind-leg action, usually arising from malformed hocks possessing only limited mobility, is most especially to be guarded against; horses with round bowed-hock action always wear unsatisfactorily. Following the extension of each limb in turn, the corresponding foot ought to be boldly and firmly planted upon the ground.

The least sign of weakness, faltering, or unequal movement during progression may be regarded with grave suspicion; and it is much safer to refuse an animal where such reasonable

grounds for it have been aroused than to run the risk of effecting an unsatisfactory purchase. Whenever practicable, a trial at work ought to be insisted upon before a purchase is completed, not only for the purpose of ascertaining that the power and temper of the animal are suited to what is required from him, but also that any symptom indicative of defect or unsoundness, particularly of the respiratory organs and spine, may be surely detected.

Good action in all horses generally coincides with symmetrical and definite proportions, and these the experienced eye of the horseman can quickly discern ; while from them he can arrive at a tolerably satisfactory conclusion as to what the horse he may be scrutinising is capable of doing in the way of work, and also, to some extent, as to the animal's action. This is the case with heavy draught-horses no less than with others. It has been recognised that a horse required to move heavy weights must be himself weighty, and also be endowed with great muscular power, evidenced by large muscular development all over ; he must also be near the ground—that is, have comparatively short, powerful limbs. He likewise should possess " strong, sound feet, broad back and loins, deep chest and ribs, prominent shoulders, wide between his fore-legs, and wide from croup to hocks ; he should stand firm and square, with his fore-limbs well outside him, the fore-feet in a direct line with the body, the hinder ones very slightly pointed outwards ; the pasterns should be sufficiently oblique to indicate elasticity and freedom in action, without being too slanting ; all joints and sinews should be well-defined, and the limbs clean and proportionate. For the purposes of heavy draught, the necessity for excellent conformation of the hind limbs is of far more importance than the symmetry of the anterior extremities, and although the perfect form and position for a horse's hind-legs are familiar to every experienced man, the difficulty of describing them is extremely great. Horses required for lighter

and quicker work in pair-horse vans may be more upstanding, but they should possess depth of rib, plenty of heart-room, and all essential qualifications for usefulness."

It has already been remarked, that perhaps no description of horse pays the farmer better to breed than the heavy draught-horse, and for the simple reason that this animal can be put to work younger than any other, as the pace is slow, and on farm land the legs and feet do not suffer as in travelling on hard roads. A riding or harness horse cannot do much labour under five years of age, whereas the draught-horse can go in "the chains" at two. Besides, a trifling injury (such as a scratch on the knee) may so blemish a riding or carriage horse as to diminish his value by more than one-half; or a slight unsoundness may develop before he is fit for the market, which may diminish the price to a painful degree. The usefulness of the draught horse is not impaired by such trifles, and their presence does not give rise to any apprehension of danger or loss of service; therefore his value remains unaffected.

The price of draught-horses does not fluctuate much, and they are less under the influence of "fancy prices" than any of the other kinds, with the exception of the pedigree stallions, perhaps, which sometimes realise large sums. The limits of price might be set down at £36 and £80 or £90, the high limit being that given for really fine dray horses. Good horses are purchased for £50 or £60. The fairs at which they are shown will be alluded to in the next chapter.

CHAPTER II.

PURCHASING HORSES AT FAIRS. DEALERS. VETERINARY EXAMINATIONS.

It is necessary, when going to a fair to purchase a horse, to first decide on the kind of horse required, and then to select your fair. We will take the different classes of horses in the following order:—First, hunters; second, hacks and harness horses; third, omnibus, van, and agricultural horses; fourth, cobs and ponies.

HUNTERS.

The chief fairs for purchasing hunters are as follows:—Preston, Lancashire, first whole week in January; Northallerton, Yorkshire, first whole week in February; Lincoln, last whole week in April; Northallerton, Yorkshire, 1st to 5th of May; Rugeley, Staffordshire, 1st to 6th of June; Borobridge, Yorkshire, 14th to 21st of June; Horncastle, Lincolnshire, whole week nearest the 10th of August; Howden, the week after Doncaster races; Rugby, 16th to 22nd of November; York, the last whole week before Christmas. A full list will be given, at the end of this chapter, of the dates of all the principal fairs in England; but the above mentioned fairs are by far the best for hunters. As a rule it might be asserted that for the better class of hunters, and also for hacks and match horses, the fair really commences about two days before the above dates. For instance, for a fair lasting a week, a large number of horses come in on the Friday and Saturday, and up to Monday a large number change hands. Therefore, to any

one looking out for a hunter, it is necessary to be there a day or two before, not after, the fair commences; later in the week —say the second, third, and fourth days—is generally given up to inferior classes of horses.

Confining our attention to hunters, the market is generally confined to Irish and country dealers; the former bring over a very large number, which they purchase at most of the large fairs in Ireland. In that country they keep them for a short time, give them plenty of food, take a little off the tail to add to their beauty, etc., and then ship them over to England. The English country dealers, as a rule, scour the country in their different localities, in addition to having agents in different parts of the district; they also bring a large number of horses together. The English, however, go in more for high-stepping match horses, park hacks, etc., than the Irish horse-dealers do.

Now for the two or three days before the advertised time of the fair, the show of horses is entirely confined to the different inn yards; a few people may be seen walking across the streets, yet there is nothing in the appearance of the place to lead one to suppose there is anything more going on than usual. But if you turn down the different stable yards and look into the stables, you will find scarcely a stall unoccupied. The day before the fair the yards are pretty well crowded with people.

The business transacted during this time is principally with dealers; very few horses are bought "privately"—that is, not for sale again. Most of the horses pass into the hands of London dealers, who attend all these fairs; in fact, most of the horses they obtain are bought at these fairs from the Irish and country dealers. In most of the large fairs in England there are very few local hunters shown; take Lincoln, for instance, one of the best fairs in England for almost every class of horse. It may be said that there are not ten hunters shown

there annually that come within ten miles of the city. The trade in hunters, therefore, at this fair is between country and London dealers, and the fair is the recognised centre where they meet.

In searching for a horse, the first thing to do is to walk through the different inn-yards and look into the stables, and having seen an animal suited to your requirements, as far as can be ascertained in the stable, request the dealer to bring him out, which he is only too pleased to do. It is well at this time to inform the dealer that if he allows the horse to be "fidded" (a most pernicious practice), you will not look at him. He will then take care the groom does not commit this offence, which, it may be observed, improves some horses, especially those with short drooping quarters, as it makes the horses carry their tails well up in the air. What a purchaser wishes to see, however, is the tail carried in its natural position. Watch the horse carefully as he walks out of the stable; any slight stiffness or difficulty in flexing the hocks is best seen at that time. The groom will then place him close to a wall, the side of the stable, or in any situation close by where the horse can be seen at his best; this is the time to decide as to the animal's age, conformation, and general suitability as regards the weight he will have to carry, etc. He must have a sloping shoulder, be well ribbed-up, and have strong muscular loins well united to the back. Some Irish horses have sloping or drooping quarters, and the tail set on low; but if there is plenty of width about the hips, if the quarters are muscular, with well-developed "gaskins" or thighs, and hocks well let down, he is well shaped for jumping.

All hunters, as already mentioned, should have good, sound, flat legs, and the body not too heavy for them to carry; a big body and want of substance in the legs, is a conformation often seen, and due to cart mares being mated with thoroughbred horses. There are two things often taken exception to in

English horses, and which are often seen in Irish horses, viz. :—rough bony hocks, and rings or ridges round the hoofs. The hocks if they are square, wide, well let down, and both alike, often are the best and strongest hocks: big hocks with plenty of room for insertion of ligaments and tendons are safest and most durable. With regard to the ringy or ridged hoofs—if the foot is of a good shape they should not be objected to; the ridges are called "grass rings," and are due to the animal being pastured in damp fields, bogs, etc.

A favourite description of the dealers, if they have a good-looking horse, but one a little flat in the sides, and light behind the saddle, is to say "the horse has been off his feed for some days owing to a change of stable, but he will fill out afterwards." But if the horse is to be purchased he should be taken as he is; at the same time it must be remembered that the conformation is a bad one for any horse that has to gallop and carry weight.

Having decided on the above points, the horse should be walked with a loose rein away from the purchaser. Some horses go close at a walk and wide at a trot; others *vice-versâ;* but a good horse should always walk well. Then have him trotted. It is a good plan to have the horse either taken into a street or road for this, as the inn-yards are usually covered with straw, and no true idea can be formed of a horse's action on straw. As a rule, he goes higher and steps better on straw than on the road; it is also to be noted that a slight lameness which would be imperceptible on straw or on soft ground, is very apparent on the hard road. The horse should have a snaffle bridle on, and the man ought to take the rein over the horse's head, and hold it about eighteen inches from the bit. The animal should be run at a slow trot; if there is a slight lameness, the dealer will do all he can to make him go fast and step high, and if there is a door convenient to him, he will be kicking it with his feet to make a noise, or rattling

his stick in his hat with the same object, and one or two of his satellites will be giving him a little assistance in this manœuvre. Whether a horse is sound or unsound, there is always the very greatest difficulty to have him run at a slow trot, and it is best to refuse to have anything more to do with him unless he is made to go at the pace required.

Having seen the horse at a walk and at a trot, have the saddle put on in order to ascertain how he carries it. He should then be again walked and trotted from and towards the purchaser, with a man on his back. Some horses go lame with weight on their backs, and sound without. It is well to get the horse out of the town, on to a quiet road, and either have him ridden at a gallop, or the purchaser should ride the animal himself. The latter is much more satisfactory—as the rider can then judge whether the horse is rough or not in his gallop, what sort of mouth he has (the latter being a most important consideration), and he also can "try his wind;" as a rule, however, there are very few hunters brought to fairs with any defect or impediment in their respiratory organs. The dealers know their horses are always galloped, so there is not much chance of their getting rid of such horses; occasionally they may try to push a slight "whistler" through a deal, but it is not often.

The more frequent cause of lameness in hunters is navicular disease; that is to be observed both in and out of the stable. A horse may be so slightly lame that it is scarcely discernible; but a good sharp gallop on the hard road may render it a little more perceptible, provided the horse is put in the stable and has time to cool down before being brought out again. The purchaser should go quietly into the stable before he is brought out, and watch the horse carefully, so as to note whether he "points" or not. Pointing is standing with the lame leg flexed. Horses with very slight lameness will occasionally "point."

Any sign of "windsucking" or "crib biting" can be seen at the same time. However, the latter is rare among horses of that class, or, to speak more properly, dealers so seldom own horses having that vice that the "cribbers" are generally shown in the street; and when you ask the seller to put the horse into a stable for a short time, and provided he is all right you will pay for him afterwards, that individual generally has a great aversion to adopting this course or lodging the horse in a stable at all. "What can you want him in a stable for?" he asks; "here 's the horse, you can have any trial you like with him; what more do you want?" The purchaser says he always likes to see a horse in a stable, and the seller then pleads that he might miss another customer.

However, it generally ends in the seller keeping his horse, as nothing will induce him to put him in a stable. Occasionally a local man, for some reason or other, is afraid to stable his horse. A very fine horse, belonging to a farmer, was seen at a fair in Oxfordshire, and the bargain was concluded, but before he was paid for, it was requested that the horse might be put in a stable. Nothing would induce the seller to accede to this request, and he took the horse away. However, as the horse was very much liked, he was followed, and at last the reason for refusal was given by the farmer. He was afraid some one might take the horse away while he was waiting at the inn to be paid for him. So that in these cases, it is necessary to find out as much as possible of the character of the man you are buying the horse from, and form an opinion accordingly. In the above case the horse, when lodged in the stable, was found to be all right.

Laminitis, or the result of it, in the shape of flat feet, is a frequent cause of unsoundness. Some horses have naturally flat feet, and therefore it is very necessary to decide between what is natural and what is the result of disease. In a busy fair there is not time to take off a horse's shoes, and in the

next place, probably the dealers might object to this, as they do not like their horses' feet mutilated by village farriers. In lameness from this cause, and also from navicular disease, notice should be carefully taken as to the manner in which the horse goes when he is pulled up, as at that time an animal may often show slight lameness, but travel all right when going straight. More weight is put on his legs and feet when pulling up than at any other time.

A horse lame from flat feet generally has a tendency to go on his heels in front; while in navicular disease he will dig his toes into the ground. As said before, there is a good deal of risk at fairs with regard to the state of the foot: "corns" and "seedy toe" are common causes of lameness in hunters, hacks, and all well-bred horses. Side-bones are rarely seen among hunters at fairs, owing to most of the horses being young (generally from 3 to 6 years old).

Round joints, accompanied by "wind galls," are sometimes seen in young horses with upright fore legs, especially in those which have been used a little. However, this is a condition more or less dependent on defective conformation.

Splints are very common, very few horses being without them; they seldom cause lameness, and unless they are very large, or are placed in such a way that they interfere, or are likely to interfere, with the action of the suspensory ligament, or are liable to be struck with the opposite foot, no horse should be rejected on their account.

Thickening of the flexor tendons, and of the suspensory ligament, is serious. The latter lies between the back tendons and the bone, and the enlargement is generally seen on the inside, about three parts of the way down from the knee to the fetlock; about that point the ligament branches into two portions, and it is there that nearly all the sprains take place. A horse with the least enlargement there should on no account be purchased.

Thickening of the tendons among horses sold at fairs is, as a rule, very rare, or if present very slight, as no horse could be sold if it were marked; as with the thickened ligament, when it is present it is very small. However this may be, a horse should be at once rejected for either thickened tendons or ligaments, as it is a grave defect; for if the animal at any time subsequently, and especially in hunting, is made to undergo very severe exertion, he will probably give way in this, his weak part. To find out these defects, it is necessary to compare both legs by passing the hand first down the tendons of one leg and then those of the other; and if the ligament or tendon in one feels thicker than its fellow, then the examiner may feel quite sure there is something wrong, and should have nothing to do with the horse.

"Broken knees" are, as a rule, not of so much consequence to a hunter as to a hack or harness horse, and do not affect the price so much as with the latter class. In a stone-wall hunting country, it is very common to see really good hunters with blemished knees. If the action is good, square, and clear, and there is no "brushing" or "speedy cutting," it may, as a rule, be concluded that the blemish was the result of an accident. If the blemish is noticed, and the dealer says the horse hit the knee against the manger, then have nothing to do with the animal, as no honest dealer would make such a statement. Horses generally get broken knees by falling, and sometimes in jumping; but cases are so rare as to be almost unknown in which injury was caused by knocking the leg against the manger.

Some horses will rub the hair off their knees in the stable, but the hair roots can always be seen, and there is no scar. To find out whether there is a scar or not, the hand should be rubbed against the hair, and the hair may be slightly damped.

Horses with the point of the hip knocked off are often seen at fairs. The injury depreciates the animal's value. It

is discovered by standing behind the horse and comparing the two quarters, when it will be found that one is more flat-sided than the other. It is a common blemish in young horses on farms.

One of the most common of all kinds of unsoundness among hunters at fairs is "spavin." It is essentially necessary to examine the hocks most closely and carefully, not only as regards any disease in the hock itself, but also with respect to its conformation.

A horse may be bought at four years old with what are called "coarse" or "rough" hocks, that is, hocks with large bony prominences; yet these hocks may be well shaped, large, and clean, and the horse that owns them will remain sound for years; on the other hand, if we take another horse of the same age, but with small, narrow, though "clean" hocks, and no sign of spavin, the probability is that the spavin will appear before long, especially if he does much galloping and jumping.

A trick some dealers have, is to make a wound or scratch over the enlargement of spavin; they then say that the swelling was caused by a kick, and direct attention to the scar of the wound. A case in point came before the writer. The horse had a large spavin, across which there was a long cicatrix extending well back, where the enlargement was most prominent; the owner gave a guarantee of soundness, but the horse went lame the second time he was taken out, and was returned. Cases of this kind show how necessary it is to be careful with regard to examining hocks.

Some dealers having a horse slightly lame from spavin, will keep him continually on the move from one side of the stall to the other, to keep off the stiffness when he is shown. As a rule, the spavins on lame horses are large ones, and placed well in front of the hock. If a number of horses going lame from spavin are noticed, nine out of ten will have large spavins, easy for any one to see. In the majority of cases, spavins in

hocks are due to defective conformation, and are developed through horses being worked before they arrive at maturity.

"Curbs" are occasionally seen in hunters at fairs; but as a rule they are not actual curbs, being only what is called "curby hocks." The straight line from the point of the hock downwards is not preserved, and there is a slight convexity. This condition is generally associated with shortness of the point of the hock, and a narrow, tied-in appearance of the lower part of the joint.

"Curby hocks" are weak, and horses with them should not be bought, except at a much reduced price, and then only with a view to light work.

"Thoroughpins" and "bog-spavin" often go together. They are generally seen in short fleshy hocks. If the "thoroughpin" is hard and tense on pressure, with heat in the part, it is better to leave the horse alone, especially if a four-year-old. If a five or a six-year-old horse, and the hocks fairly well shaped, and if the horse also goes perfectly sound, he might be purchased at a price. Sometimes "bog-spavins" are so large that, independently of unsoundness, they are a serious blemish, and the horse's value is depreciated accordingly.

Cataracts are very often seen in the eyes of hunters; although according to law a hunter means a horse sound in his wind and eyes, they should always be looked for. In very dull days a small speck in the eye is most difficult to see. It is always a good plan to look for cataract as the horse is coming out of the stable, with his head towards the door. Some dealers will guarantee a horse to a certain extent: that is, they will stand to the description they give; others will sell a horse to be a sound one, and if he turns out to be unsound they will take him back; but unless the seller is a reliable man and well known to the purchaser, it is very much better for the purchaser to find out as much as he possibly can for himself, and take the dealer's information for what he considers

it worth. The writer remembers buying a very handsome cob at a fair in the north of England, and as he was wanted for harness, as well as to ride, the dealer was asked if he would warrant him quiet in harness. "He would not warrant any horse," he said; "but he would give his word that he was quiet, as he had driven him himself." However, it was afterwards found that the animal was anything but quiet; in fact, he was a most dangerous beast to drive. Meeting the man again, he was taxed with the deception. He said he thought the horse was quiet, as the person he bought him from had him from a farmer, and the farmer said he had driven him. This instance is only given to show how little such statements are to be relied on, with regard to a horse a dealer wishes to sell. It is the same with other horses, both as regards their soundness and freedom from vice, and whether they are quiet to ride or drive. Dealers have horses in their possession such a short time, that they cannot possibly know much about them. We are speaking more particularly about hunters, and only citing the case of the cob as an illustration.

Nearly all the business done at the fairs in hunters is with dealers, as stated before; it is almost entirely a separate business. When the fair commences in the street, most of this business is over, and the market is full of horses of different classes. Should a hunter be seen in the streets, which has been standing in stables for two days previously, one of two things is the cause of it: either he has missed his market, which sometimes occurs, or he is unsound for some cause or other, which more often happens.

HACKS AND HARNESS HORSES.

These horses, as a rule, are purchased in quite a different way to hunters. A large number are shown by local people; others belonging to private individuals are sent, perhaps, fifty

or a hundred miles to the fair. These horses generally parade the streets, and the dealers in this class have their men stationed on the different roads leading into the town. When a horse comes to the fair of the class the dealers want, either the dealer himself or one of his satellites finds out all about him, and if the price is right they generally buy. When such a man is engaged in bargaining for a horse, no one thinks of going near him; in fact with some men it would be dangerous to do so. There is nothing that touches a man so quickly as his pocket; and if a person were to ask the price of a horse while another was trying to buy it, the seller would hold out for his price on account of the chance of the other purchasing, as well as thinking more highly of his horse, than he might otherwise have done. When purchasing a hack or harness horse in an open fair, after ascertaining the price (which is a most important thing to do, as it is of no use taking any further trouble if the seller wants £60 for his horse and the buyer will only give £35), the age should be known. If the animal is three, four, or five years old off, or even six years old, there is a reason for his being at the fair. At three or four years of age the breeder wishes to get rid of him, and up to five or six years a man may have a horse that he wishes to realise his money on; but after that age, as a rule, in this class of horse, there is some reason connected with the horse himself for his being there. If a harness horse, he has probably taken a liberty with the carriage, either by running away or kicking; if a hack, he is difficult to ride, or has a hard mouth, etc. These are things that the buyer has not much opportunity of finding out; as a rule it is better not to buy a horse over five years old at a fair. There are, no doubt, many horses over that age at fairs both quiet and sound, but there are a very great many that are not.

Action and conformation are the two great points that govern the price of hacks and harness horses; some very good

looking horses, with the exception of having upright shoulders, may be worth from £40 to £60 for harness purposes, which, if their shoulders had been more oblique, would probably have sold for £40 or £50 more as hunters.

As regards action, to command a good price horses of both these classes must step; in the hunter it is not so necessary, he is for galloping. Therefore, when purchasing hacks and harness horses, great attention should be paid to their action. If a horse is a very high stepper, his feet must be carefully examined, as that kind of animal is most liable to laminitis and corns, the result of concussion.

Broken knees, which are not of such great importance in a hunter, are matters for most serious consideration in hacks and harness horses; they not only very much depreciate their value, but it is for the purchaser to consider whether, even if their action was good, and there are no evidences of "brushing" or "speedy-cutting," it is worth the risk of buying. A horse with a slightly blemished knee is bought from a farmer who says he slipped down in a cart, when drawing a heavy load up a hill. The horse's action is remarkably good and clean; he is bought, but he falls twice, and badly, both times in harness, within two years. We have heard of many similar cases to this. On the whole, we should recommend a horse with blemished knees to be left alone. Splints, sprains, thoroughpins, contracted feet, flat feet, and occasionally side bones, are frequent causes of lameness in this class of horse. Cataracts should be carefully looked for, as if they are large they often cause horses to shy. These horses are generally shown in the midst of the crowding and bustling of the fair, so that there is some difficulty in having a good look at them. Under such circumstances, it is well to get a selected horse into some quiet side street, where the purchaser can take his time in looking over him. It is always very necessary to gallop him, in order to ascertain the condition of his breathing; a large proportion of young

horses, comparatively speaking, are either "whistlers" or "roarers."

Occasionally a "rig" has been found in a fair; he is generally full of flesh, with a thick neck; notice particularly if he is quiet when passing other horses. Should there be any doubt, have each hind leg pulled forward, which will expose the scrotum to view on each side; if there is only one scar there, it will show that the horse has not been properly castrated; if there are two, and the horse appears quiet, it may be due to his being recently castrated. However, a thick gross neck is often seen in foreign horses, but in this case the neck is generally short, the shoulder upright, and the head badly put on. Foreign horses are more plentiful at fairs than formerly.

The fairs named for buying hunters are also good fairs for hacks and harness horses. In addition there are the following:

Banbury, Oxfordshire, on the three days preceding the first Thursday after the 18th January; on the first day there is a horse show held and prizes given in different classes; a few hunters are shown here, but they are not of a very good class.

Beverley, Yorks, Monday, Tuesday, and Wednesday, before the 23rd of February.

Kendal, Westmoreland, 22nd February.

Downham, 1st, 2nd, and 3rd March.

Durham, last Friday in March and two preceding days.

Apperley, Westmoreland, 2nd Wednesday in June and two preceding days.

Topcliffe, Yorks, July 17th and 18th.

Ripley, Yorks, 26th August.

Barnet, Middlesex, 4th, 5th, and 6th September.

Peterboro', 6th October.

Weyhill, Hampshire, 10th October.

Newcastle-on-Tyne, last Wednesday in October.

Van, bus, and cart horses are bought in the same way as the former class, but the trade is more developed. There are

many dealers in London who entirely confine their business to this class of horses, as there is a constant and large demand for them; consequently, they are always a saleable article. These horses more frequently have side-bones than any other class, and, differing in this respect from hacks, harness horses, etc., they are often in the market up to ten years of age, sound and fit for work; their prices vary from £25 to £50 or £60. Good 'bus horses are worth from £35 to £40, van horses about the same prices. These horses can also be bought at all the fairs previously named, but the following are the best fairs in England for this class:

Cockermouth, 17th and 18th of February; on the first day of the sale there is an auction, and from one hundred and fifty to two hundred horses are sold, principally 'bus and cart horses; sometimes there is a very fine show.

Wigton, 19th February, is also a very good fair; these places are in Cumberland and follow each other.

Borough Hill, Westmoreland, on the 30th of September, is about six miles from Appleby, and about half a mile from Warcop station on the N.E. Railway. It is one of the best fairs in England for strong horses.

In Ireland, where heavy horses are not generally bred, and those which form the chief produce of the country are hunters and troop horses, the fairs are as follows:—

Athlone (Co. Westmeath), first Monday in September;

Ballinasloe (Co. Galway), a very important fair, first Tuesday in October;

Banagher (King's County), September 15th to 18th;

Banbridge (Co. Down), January 12th and June 10th;

Cahirme, a good fair, July 12th;

Kells, July 13th, September 9th, October 16th, November 8th;

Mullingar, July 4th, August 29th, and November 11th;

Munster (Limerick), July 29th and October 28th;

Tuam (Co. Galway), October 20th and 22nd.

Occasionally at these fairs a good cob can be bought, but of all classes of horses shown at fairs the most difficult to procure is a weight-carrying hunter, or a weight-carrying cob; the reason is that there is a limited number of that class bred, and there is a great demand for them at the same time. Cobs vary in price from £20 to £50, but there are very few at any fair that realise the latter amount.

It may be remarked, with regard to the prices of horses in general, that hunters seldom bring more than £200 at a fair; the reason is that there are dealers in Ireland, as well as in England, and whenever they can find a weight-carrying hunter, with good shoulders and good manners, they buy him, knowing the demand there is for that kind of horse; there is no need to go to a fair to sell him. Hunters at fairs are generally up to from eleven to fourteen stone, and their price will vary from £60 to £130. Hacks and harness horses of the better class average from £40 to £60; match horses, if they have good action, being more expensive. Cobs vary in price according to their size, shape and action; but from £25 to £40 will buy the majority of them. Really good cobs up to weight are scarce, while good prices are difficult to obtain.

In conclusion, it may be stated that it is difficult and hazardous buying horses at fairs; no matter how careful and skilled purchasers may be, they are deceived occasionally.

BUYING FROM HORSE DEALERS.

Perhaps the most satisfactory procedure for the less experienced to adopt in horse-buying, is to resort to a dealer of good repute, and place yourself in his hands—telling him what you want and the price you are willing to pay. If he will find the horse, allow a trial of him, and a veterinary examination, what more can be desired? If sound and suitable, and the

price not much more than you stipulated to give, there is an end to the search. The money should not be paid before the trial or the examination, and if the dealer is respectable and cares for his good name, he will deal fairly with a customer who trusts him. No verbal warranty, can, as a rule, be relied upon. If a dealer verbally warrants a horse sound, or free from vice, or quiet to ride or drive—though few dealers who do not desire lawsuits will do either—and the animal turns out differently, the chances of a favourable issue of a trial in a court of law, if he will not take the horse back, are very risky. If the horse does not suit after purchase, a reputable dealer will change it for another, though probably he will expect more money. After a long experience of dealers, this mode of purchasing can be recommended to those who have neither the time, patience, skill, or judgment to buy in fairs or at auctions. The latter are quite as risky as fairs, unless the horses are well known before the sale.

BUYING FROM PRIVATE INDIVIDUALS.

In buying from private persons, if they are known to the buyer or his friends as trustworthy, there is less hazard than in purchasing at fairs or auctions. Nevertheless, if the character of the horse is not known, or his good or bad qualities not apparent, much circumspection is generally necessary. The old maxim holds good here as elsewhere, that "the buyer hath need of a thousand eyes, but the seller only one;" and in selling a horse, conscience is often strangely kept out of the way. If the capabilities of the horse are in doubt he should be tried and carefully tested, and a veterinary examination obtained. A clear understanding of the terms of purchase should always be arrived at.

VETERINARY EXAMINATIONS.

As a general rule, if it is desired to be on the safe side with regard to soundness or practical usefulness, the horse-

buyer had better obtain the professional opinion of a veterinary expert, whose knowledge and experience should be a reasonable guarantee of protection from imposition and loss. Immense numbers of horses are purchased on the understanding that they will pass a veterinary examination, and the veterinary surgeons who are entrusted with the serious responsibility of examining them, are bound to use their best endeavour to discharge this duty faithfully and well. A warranty of soundness they cannot give, but they furnish a certificate stating that their examination has had a certain result, which, so far as their opinion goes, must be accepted as correct. The veterinary surgeon is the intermediary or arbiter between the buyer and seller, but he is bound to protect the interests of the buyer by candidly and truthfully giving his opinion. To both buyer and seller this is a fair course to adopt, and greatly facilitates business, while obviating recourse to the expensive and unsatisfactory arbitrament of the law.

CHAPTER III.

THE PADDOCK, STRAW-YARD, STABLE, AND STABLING.

THE PADDOCK.

A PADDOCK is advantageous for rearing young horses, for turning out horses when not required for work, and for restoring to health or soundness those which are recovering from lameness or sickness. From some points of view the term paddock is synonymous with pasture, though the latter usually means a more extensive area than the former. In both horses may be turned out, from motives of economy, or for other reasons, during summer and winter. A paddock or pasture should afford a good growth of sweet and rich herbage, and be, if possible, of extensive range, with sound and safe fences. Locality will greatly influence the character of pastures; those which are low-lying and moist are considered best for rearing large colts, and for horses suffering from debility, lameness in the limbs, or diseased feet. Those pastures which are on undulating and hilly ground have their advantages, as the air is drier and the ground harder; they are preferred for young colts, as the hoofs grow more compact and firmer. Pastures or paddocks which have been grazed upon by horses only for a number of years, are generally considered as unsuitable for growing animals, or not of much advantage to any; as the herbage does not contain a sufficient amount of nutriment, while the land becomes impregnated with the germs of the worms which infest horses. It is, therefore, recommended that grass land which has become "horse-sick" should be ploughed and subjected to

a thorough course of cropping before it is relaid in grass. If the paddock or pasture, however, is only grazed upon at intervals, this breaking up of the land need not be resorted to, but a top dressing of some kind will prove beneficial; while scratching and rolling in the spring, if the area be not very extensive, will favour the growth of succulent grass. For young animals, and even for old ones, a good pasture generally affords sufficient amount of nourishment; but if there is not sufficient grass, or if the animals are valuable, this should be supplemented by an allowance of hay, or even corn, as occasion demands. It is well to have a pond near for supply of good water, if this cannot be regularly given; or a large trough or cistern placed in a corner may be regularly filled. It is also very advantageous to have a shed into which the horses can retire during stormy weather, during the mid-day heat, or to escape from the flies; especially is this necessary if there is no shade to be obtained from trees.

If kept in the paddock or pasture during the winter, an allowance of dry forage is indispensable—such as hay, or hay and corn, or straw-chaff mixed with corn and pulped roots.

THE STRAW-YARD.

When a paddock or pasture cannot be made available, or when circumstances require otherwise, young horses, those which are resting, or those recovering from illness, are sometimes accommodated in a straw-yard; indeed, accommodation of paddock and straw-yard is not at all uncommon, especially for rearing colts from one to three years old, as it is economical and beneficial. Sufficient exercise and liberty are ensured to promote growth, they can be more easily handled and submitted to restraint, while they are protected from the inclemency of severe weather, and can be fed with dry food as occasion may require. The straw-yard should be kept as dry as possible, rotting manure not being allowed to lie in it, unless

well covered with fresh straw, as it is very damaging to the hoofs. The shed, or sheds, if there are no stables or loose-boxes opening into the straw-yard, and if they are not closed in, should have a favourable aspect, exposure to cold winds, or drifting rain, sleet, or snow, being likely to cause injury to health. It should not be forgotten that changes from straw-yard to pasture, and from pasture to straw-yard, should be gradually effected, until the horses have become accustomed to them.

When a number of horses are together in a paddock or straw-yard, or when cattle are associated with them, certain precautions are necessary to prevent injury. The shoes of horses should be taken off the hind feet, at least, to avert damage from kicks; while cows should have the points of their horns rendered innocuous by being capped with balls of wood or metal. Unshod hoofs require the farrier's attention now and again. Farm horses are usually turned into the straw-yard at night during hot weather, and this practice is a benefit to them, as the open air is better than the close, foul stables in which they are kept for so many months in the year; of course, their shoes are not taken off, as they are required for work during the day.

STABLES.

By far the largest number of horses are kept in stables, as in these condition for hard work is best maintained, cleanliness can be easier attended to, convenience in working is greater, and the horse himself is more amenable to discipline and control. It is the fact that, in eastern and southern countries, working horses can stand out of doors for the greater part, or even the whole of the year; but even in these countries shelter from the burning sun is always grateful, if not absolutely necessary, for a good state of health.

Stables have frequently to be made in all kinds of places,

especially in large towns, where space and other circumstances interfere with judicious planning. But however this may be, there are certain essentials which should be found in all stables —sufficient dimensions, proper ventilation, fair amount of light, good drainage and flooring, freedom from damp, favourable surroundings.

The construction of stables varies from the simplest to the most elaborate plans, but there is no doubt that so long as horses obtain plenty of fresh air, good food and water, and protection from the weather, the simpler the construction of the stable—having regard to convenience—the better. When possible, the stable should be built on permeable or gravelly soil, open situation, moderately elevated, and advantageous for natural drainage.

A warm, sunny aspect, such as the south or west, is to be preferred. A stable facing the north or the east is generally cold, and, if the windows only look in these directions, dull. Stables surrounded by high buildings are not so good as those which are in open spaces, and arranging stables in a square is objectionable, as some of them must have an unfavourable aspect, and the circulation of air is generally more or less interfered with.

In constructing stables, the plan and elaborateness of finish will depend upon the money to be spent, and the locality and other circumstances. In towns, in establishments where a large number of horses are kept, the stables are arranged in all kinds of ways—downstairs, on the ground-floor, and upstairs, even to a second floor—the exigencies of compactness and economy in space demanding the exercise of ingenuity in making the most of what can be obtained. But in all these, the essentials of good stables, which we have already enumerated, should be secured by every possible means.

As has been said, the site for a stable should be well drained, and the foundations dry. It has been recommended

to lay the foundations on slates, or on two courses of hard bricks set in cement, or on asphalte, in order to ensure dryness, as damp stable floors and walls are extremely injurious to horses in many ways, but chiefly from generating rheumatic affections of the limbs. The thickness and the nature of the walls will depend upon the dimensions of the stables. In some localities the walls are simply unbaked clay or mud, or wattle covered with clay; these may answer very well in temporary stables, and especially for those of cart horses; in other localities the walls may be of concrete, when the nature of the soil is favourable for making it; but of course the most durable stables, and those which admit of the most elaborate finish, are built of stone or brick. It is simply a question of cost. Mud or concrete walls, with a felt or thatched roof, and simple wooden internal fittings, make up the cheapest stable; corrugated iron also makes a cheap stable, but these buildings are generally cold in winter, and hot in summer.

Stables built of wood have the same disadvantage, and the additional one of being very dangerous for the horses in case of fire; those built of hurdles and thatch are particularly so.

The situation of doors and windows will depend upon circumstances. The number of doors must also depend upon the size of the stable, with regard to convenience; there may be a door at one, or at each end, or one in the middle, or at each side. The advantage of having doors at each end, or on each side, consists in the easier access to the stalls in the stable if it be long, and also in bad weather, when those exposed can be kept closed. In some large stables there are doors at the ends as well as at the sides. The windows should, if possible, be east and west, to ensure the stable having the morning and afternoon sun. Side windows are often the only kind which can be allowed in stables; but when there is no loft or building overhead, light from the roof is very advantageous, so long as there is not too much glare or heat during the summer. For

the maintenance of an even temperature, and especially to ensure dryness—important considerations where valuable horses are kept—the walls should be thick, and lined with plaster or cement; some stables have the inner bricks of the wall glazed, and either white or of a neutral tint; others are oil-painted, which allows them to be easily washed and kept clean, while others again, less expensively finished, are merely whitewashed.

When there is no loft overhead, the stable may be roofed with slates or tiles; the former have the disadvantage of allowing the stable to be very hot in summer, and to obviate this a layer of felt has been recommended to be laid between the slates and the boards, or even a lining of thatch inside the latter, or a partial ceiling of boards a few inches from the roof. It must be remembered that too warm or too hot stables are unhealthy, and especially for horses exposed to sudden changes and inclemency of weather, as they feel the effects of external cold in proportion to the warmth of the stable they stand in. It has long been recognised that a cool stable makes a healthy horse, and so long as the temperature does not descend below cool, efforts should be made to keep it comfortable. A high temperature in summer and a freezing one in winter, are to be alike avoided.

DIMENSIONS.

The dimensions of a stable will, of course, depend upon the number of horses to be kept in it, and the amount of cubic space necessary to ensure health. Nothing in the whole range of horse management, next to a proper allowance of food and water, or even on an equality with it, is so important as a sufficient supply of good air in stables, and this can only be secured by efficient ventilation and a due allowance of cubic space. Without a sufficiency of pure air health cannot be long maintained; and the number of diseases which are caused by breathing foul air, as well as the predisposition to other most

serious disorders incurred from the same influence, is notorious. The gases given off in the act of expiration through the lungs and skin, as well as those generated in the decomposition of urine, fæces, etc., in the stable, are poisonous when breathed, and are irritating to the air-passages and eyes; while the food is also tainted with them, and is, consequently, less liked by the horses.

Horses kept in the foul air of imperfectly constructed stables, or in over-crowded dwellings, are never so strong or healthy-looking as those inhabiting roomy and airy places; they require more food to perform a given amount of work, are easier fatigued, and their circulation is weak. Consequently, they suffer from swelled legs, are often affected with a chronic cough, and are particularly liable to colds; and if a contagious disease, as glanders, for instance, appears among them, it spreads rapidly, and is most difficult to eradicate. And when influenza visits such stables, it always manifests itself in a more severe and fatal form, attacking a larger number of their inmates. This was well demonstrated some thirty years ago, during an outbreak of influenza at Boston, U.S.A., when the disease assumed a rather serious form. At the instigation of a medical authority—Professor Bowditch—every stable in the city was inspected and reported upon, being classified as "excellent," "imperfect," or "wholly unfit," in respect to ventilation, cleanliness, dryness, warmth, and light. It was found that in the first-class fewer horses were attacked, and the disease was milder, and more rapidly recovered from; in the second class more were affected, and recovery was longer; while in the third class every horse was seized with the fever, the symptoms of which were most aggravated, and the rate of mortality was very high. So that, in summing up, it was found that in respect to the numbers attacked, the three classes stood to one another as 1, 3, 5.

The horse is a large animal, comparatively, with very

capacious lungs and active respiration, and adapted by nature to live and thrive best in the open air. In proportion to his activity is the amount of tissue waste, and therefore of worn-out and deleterious matter thrown off from his body. Therefore, there is all the more necessity for an abundance of fresh air, and the speedy removal of that which has become deteriorated. It is in over-crowded, badly-ventilated stables, where sanitary rules are ignored, that diseases are most prevalent, and horses are shortest-lived; and when such insanitary conditions are combined with hard work, and bad or insufficient food, then we have present everything required to diminish efficiency, induce disease, and curtail existence.

It must not be forgotten that a hot stable may not be a foul one, though it very often is; nor a cold stable a well-ventilated one. On the contrary, a stable may be warm, and even hot, and yet contain less foul air than one which is cooler. But there can be no doubt that hot stables are generally foul, as the higher temperature not only usually implies insufficient cubic space and an inadequate supply of fresh air, but it also indicates more rapid decomposition of urine, litter, and other matters, and the consequent disengagement of hurtful gases, and diffusion of these in the limited atmosphere.

And even when there is ample cubic space, and the means for ensuring ventilation are present, there is often a strange tendency on the part of grooms and horse-keepers to ignore or nullify these, by excluding, in the most careful and laborious manner, the entrance of the uncontaminated air from without. They seem to have a most unaccountable and perverse liking for a hot and foul-smelling stable atmosphere, and to obtain and enjoy it they will keep windows and doors rigidly closed, shut down ventilators, or choke them with bundles of straw, pack every crevice through which air may chance to enter, with the same material, and even obstruct the keyhole. The

hot, damp, and sickly smell they seem to revel in, and it is all the more enjoyable if it be so impregnated with the fumes of ammonia as to tickle the olfactory nerves of the chance visitor, and bring tears to his eyes. Such a sweltering, suffocating atmosphere cannot be good for man or beast. And as evidence that it is pernicious to the mistaken individuals who indulge in it, we have but to look at their pale, pasty countenances, and the general unhealthy condition of many of them; while as to their unlucky charges, the proof that they suffer much more is to be found in the fact, that they are the most remunerative patients the veterinary surgeon has, as they most frequently, and for the longest periods, require his attention.

The amount of gaseous and organic impurity in the air of stables can only be determined by chemical analysis. The most dangerous of the gases is the carbonic acid given off by the lungs and skin, and which, when more than a most minute percentage is present in the atmosphere, is injurious, and even poisonous; while the amount of it in stables is also an indication of the likewise hurtful organic matter suspended in the atmosphere of these places. The carbonic acid in well-ventilated stables should not amount to more than ·6 per 1,000 cubic feet of air; if it exceeds this, then ventilation is defective, and the horses are inhaling an impure atmosphere. How impure and destructive this may be, in some instances, is shown by the fact that 1 per 1,000 renders the air of a room "odious and unwholesome," and offensive and oppressive to the persons breathing it; while in some stables, the air of which has been examined, it has been found as high as 2·65 per 1,000, and even 7, 8½, and 17 per 1,000 in stables on the Continent.

It is astonishing that horses can exist at all in such places; and doubtless they escape speedy death by being out at work in the open air for some hours, in the course of the day.

The other objectionable ingredients in the air of stables are the ammonia, organic matter, and moisture exhaled from the lungs and skin, or evaporated from the urine, etc.

The amount of cubic space necessary for each horse in a stable will depend to some extent upon the construction of the stable and the means for ventilation, as well as the size of the horses. It has been estimated as high as 2,000 cubic feet per horse, and sometimes it is found to be as low as 500 feet. But while it may be taken at about 1,200 to 1,500 feet, it certainly should not be less than 900 cubic feet per horse.

Too much cubic space, while it is very advantageous in summer, and even in winter if the stable can be kept warm by artificial heating, or the horses made comfortable by clothing and leg-bandaging, is yet objectionable at the latter season if warmth cannot be ensured.

It has been laid down for guidance, in building stables for draught horses, that the internal measurements should allow at least a distance of 18 feet between the front and rear walls, and a width of not less than 6 feet for each single stall, to provide sufficient air space (about 1,200 cubic feet per horse). If the stable has a loft overhead, the height should be 12 feet, but if open to the roof, sufficient capacity may be afforded within the angles of the slopes.

As to the internal arrangement of the stable and the ground area per horse, this again must depend upon circumstances, to some extent. The ground area has been estimated at from 90 to 100 feet; but for large draught horses it should be a little more than the latter dimension.

VENTILATION.

Ventilation is closely related to cubic space, as if it is well contrived the latter may be diminished; the object being to get rid of impure air as rapidly as it is produced, and admit

a sufficiency of fresh air, without causing injurious draughts to come in contact with the horses. Free ventilation is greatly promoted by the tendency of heated air to expand and ascend; so that if an exit be allowed it, towards the roof of the stable, it will escape, and cold air will rush in from below to occupy its place. If it cannot enter below, then it will from above, and cause down draughts.

The best system of ventilation is that which ensures a uniform supply of cool fresh air by night as by day without causing gusts or draughts, especially upon the legs. But this is not always easy to obtain, and particularly in stables which contain a large number of horses; small stables are more easily well ventilated.

Various plans of ventilating have been proposed, but they are all the same in principle, and are based upon the above-mentioned requirements, which may be summed up as escape for vitiated air, and introduction of fresh air without draughts. To ensure this object, it has been recognised that the outlet passages or flues should be more in number, but less, collectively, in sectional area, than the inlet ones, the flow of air into the stables not exceeding five feet per second; so that by having a greater number of outlets than inlets, and these as far as possible from each other, the air on entrance is diffused gently, and draughts avoided.

In the case of single stables with a loft above, and where the horses stand all one way, it has been recommended to have a nine-inch earthenware drain pipe carried in the form of a syphon through the rear wall, so as to discharge the supply vertically, at or near the ground level; while the outlet shafts (one for each three horses), which may be six-inch iron rain-spouts, should be fixed immediately over the stall partitions or bales, on the front wall, the bottoms of the pipes being level with the underside or ceiling of the stable. These pipes should be carried through the loft and the roof, and capped in such a

way as to prevent rain from entering them, though not hindering the escape of hot air. In double stables where the horses stand tail to tail, the same principle has been applied, but the inlets are carried from the outer wall under the stalls, discharging the air in the centre of the passage or gangway, both the front and rear walls being provided with exhaust or escape shafts.

If the windows in the stable are properly constructed and well placed, they greatly assist the ventilation, though they most frequently cause draughts, whether they are above the horses' heads or at the ends of the stable; while in bad weather they have to be closed. Indeed, it only too often happens that the horse keepers will insist upon keeping them closed in all weathers, and as the ventilation should be, to some extent, at least, independent of these men and of accident, it ought to be self-acting and beyond reach of interference. Therefore, if the outlet or air-escape shafts cannot be contrived as above indicated, a course of perforated bricks, or a row of perforated plates, should be introduced close to the ceiling, and on both sides of the stable, if thought advisable, so as to allow the hot air a ready exit.

When the loft above is intended for the reception of forage, there should be no communication between it and the stable, whereby the air from the latter may taint the food.

Where there is no loft, or stories above, then the air-escape can readily be secured by the open roof, either by a narrow, capped slit running the whole length of the ridge, by louvre boards, or by roof-windows, which can be made to open and shut. The ridge arrangement is good, as it is constant; the louvre boards, whether continuous or detached at intervals (the continuous are best), are also good; while the roof-windows are objectionable for several reasons.

The louvre boards are generally recommended, and, if continuous, should be about 18 inches in depth in a stable

containing two rows of horses, and about 10 inches in single-row stables. The side boards, 12 to 9 inches broad, should overlap each other, but leaving an interval between of about 3 inches, their angle being from 45 to 60 degrees, according to the exposure of the stable.

Instead of side-boards, swing-windows are sometimes introduced, these opening at an angle from the inside of the stable; and, when it is desired to have the stable well lighted, glass is preferable. Sometimes the roof of the louvre board itself is of glass, which certainly gives abundance of light, though it makes the stable hot in summer.

Inlets for the air should be near the floor of the stable, as it tends to dry this, and also because it has a tendency to ascend towards the nostrils. It should not be allowed to enter beneath the manger, unless the current is broken or diffused previously, as it will chill the horse's legs when he is standing, and his body when lying down. This break in the current can easily be effected by laying the outer course of perforated bricks at either a lower or a higher level than the inner one. It is best, however, to have the air enter—if it must enter through the front (or manger) wall—between the stalls, as then it will not impinge directly on the horses. But there is no absolute necessity for having the air enter only on one side, or even in any special part of the stable, so long as there is an abundance without draughts.

WINDOWS.

Windows are chiefly intended for light, but they also assist in ventilation. For the latter purpose, unless reliance can be placed upon the stable men, they are not so valuable; though in hot weather, and when it is required to freely air stables, it is very advantageous to have them thrown open. They may either move on a pivot at the middle of each side or be

hinged at the bottom, so as to fall inwards at the top. However they may be arranged, they should not allow draughts of air, nor rain or snow to fall on the horses. All stables should be thoroughly lighted.

FLOORS AND PAVING.

The floor of a stable should be higher than the ground outside, so as to keep it dry, and secure good drainage. The height should not be many inches, but if possible there should only be one step at the door—better if it can be dispensed with altogether.

Floors may be made of several materials, but a good paving should possess the properties of durability, impermeability, secure foothold, and be easily cleaned.

Clay, rammed hard, has been recommended; but it is slippery and dirty when wet, and constantly requires holes to be filled up. Some stables are paved with square-cut granite stones, but these, though very durable, become slippery, and should be laid in concrete, with cement or asphalte between, to prevent soakage. Common red bricks are sometimes employed, but they also should be laid in concrete and cemented, and though they are not slippery, yet they soften, soak with urine to some extent, and soon wear in holes. Other floors are made of asphalte, but they are dangerously slippery. Floors composed of lime and ashes have been favourably mentioned, if time is allowed for them to harden. Furrowed blue Staffordshire bricks are very generally used, and when set in cement make an excellent floor, providing the bricks are good and the furrows deep.

Of late years, concrete has come largely into use for paving stables, and the best is, perhaps, that known as Wilkes', which is a mixture of cement and crushed iron-slag. This makes a beautiful floor, very durable, impermeable to urine

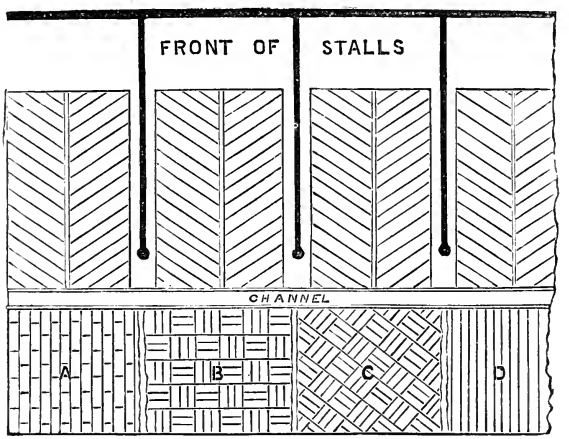
and wet, and possessing the great advantage of wearing rough, instead of smooth, while it can also be easily cleaned.

STALLS AND LOOSE BOXES.

When it is possible to do so, horses should be kept in loose boxes, even if these be no more than ten or twelve feet square. Horses can rest better in them, select the easiest position, move about, and be more contented and comfortable. They are also much less likely to acquire the bad habits of kicking, "crib biting," and "weaving."

But space and other considerations prevent the adoption of loose boxes, and the great majority of horses are kept in stalls. The dimensions of these should be proportionate to the size of the horses, but in all cases they should be roomy. An allowance of five feet and a half to six feet in width should be made, and from eight to ten feet in length should be given, for each stall; for large draught and carriage horses, seven to eight feet in width may be required. For stalls separated by partitions, more width is required than for those divided by a swung bale. For sanitary and economical reasons, bales are preferable to partitions, inasmuch as they are considerably less expensive, allow the horses more liberty to move about and get up and lie down, facilitate the circulation of air through the stable, and permit cleansing and disinfection to be more easily carried out; in case of fire, there is also much less danger, while at all times the horse will be much more easily seen. The bale consists of a thick plank the length of the stall, slung from the manger in front, and from a joist or beam behind; it usually has a shorter plank suspended from its lower border, towards its posterior end, and this receives the kicks which the horse may feel inclined to give it. The bale is suspended about two and a half to three feet from the ground.

The partition of stalls is usually from seven to eight feet high in front in order to prevent the horses biting each other, but only from five to six feet at the posterior part; a space of a few inches is usually left between the wall and the partition in front, and two or three inches between it and the floor, to allow the air to circulate. The planks forming the partition should be strong and tough, and placed horizontally, instead of

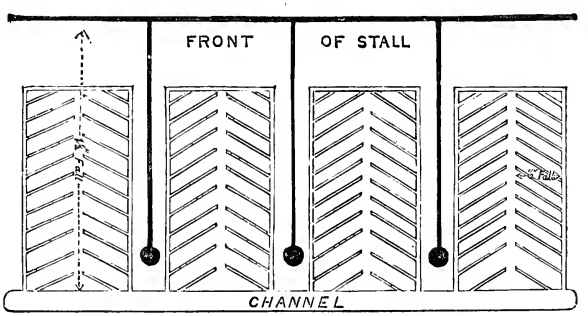


Stalls with concrete floors, the grooves of which incline backwards and inwards to the middle groove. A B C D, different ways of furrowing the pavement behind the stalls.

perpendicularly, as this will tend to lessen the risk of accidents from their being broken by kicking.

The floors of stalls and boxes should be paved with the best material, and to facilitate drainage, as well as to ensure foothold, grooves should be made in the surface. When the floor is of concrete, these grooves are made during the process of laying; they should not be deep nor yet wide, but just sufficient to convey away the urine, and afford a catch for the feet when there is no litter on the floor.

The direction of the grooves is a matter of some importance with regard to their usefulness. We may here state that the floor of the stall should be *as nearly level* as possible; as nothing is so injurious to limbs and feet, and fatiguing to the horse, than standing for a long time on a sloping surface, like that seen in many stables, where the unfortunate animals are condemned to stand, as it were, on the back tendons of their legs, as if on a hillside. A very trifling slope may be necessary—say one in eighty, as it is now in troop stables—from



Stalls with grooves in floors inclining backwards and outwards to side grooves.

the front wall to the heel drain; though it would be better if the front half were quite horizontal, as the urine does not fall beyond the middle of the stall. A very slight inclination may be allowed from each side towards the centre, and the grooves, commencing somewhat shallow, should pass in a diagonal manner in the same direction, entering a middle longitudinal groove, into which they convey the urine, which is carried into the heel drain, or channel. A different plan, which gives greater strength where most required, and two channels instead of one for drainage, is the reverse of the last. In this the floor, instead of inclining towards the middle, is very slightly higher there, and the grooves, commencing very shallow at

this part, gradually deepen as they pass outwards and backwards to a longitudinal channel on each side of the stall, these entering the heel channel.

The passage behind the stalls, if smooth on the surface, should be cut or grooved, to prevent slipping.

Some draught-horse stables are arranged with stalls nine or ten feet wide, to contain a pair of horses, by which a saving of ten feet in a ten-stall stable is effected; but this may be questionable economy.

Loose boxes in stables should have the woodwork as low as possible, the necessary height being obtained by an iron rail around the top. They should be drained in the same manner as the stalls, and it is needless to remark that they ought to be as spacious as possible.

DRAINS.

The grooves, or channels, in the floor of the stalls and loose boxes lead to the channel behind (heel channel), and this should, having a proper fall, carry the urine out of the stable. This constitutes surface drainage, the only kind which should be tolerated inside stables; underground pipes, drains, and traps are an abomination, from their becoming foul-smelling and filthy. These surface drains can be swept clean and washed with water, and they dry quickly. The urine, carried outside the stable by the surface drains, may run into other drains of the same kind, and so be carried out of the way into the sewer or manure pit.

At intervals of time, the floors, as well as the walls, windows, mangers, and woodwork, should be thoroughly cleaned by washing; indeed, the drains should frequently be flushed with water.

After such cleaning, and especially if the weather be damp, and even when there is no cleaning, but a prevalence of wet and cold, fires of coke or gas may be burned in the stables

when the horses are out, in order to dry the air and get rid of the moisture.

MANGERS AND HAY-RACKS.

Mangers and hay-racks should be of metal — cast-iron galvanised—or the manger of iron, enamelled inside. White enamelled mangers are easily kept clean, and it is easily seen when they are dirty. Wooden racks and mangers are always foul, and very dangerous when broken, or when contagious diseases are about. The hay-rack should be on the same level as the manger; when placed high above the horse's head, the dust and seeds from the hay fall into the eyes, while feeding from such a height is fatiguing; the horse is not a giraffe or a camel-leopard, but is adapted to grazing on the ground. The manger ought to be straight in front, and the upper surface should project around the cavity for two or three inches, to prevent the food being turned out by the horse; the interior should not be large, but of sufficient capacity to hold rather more than a good feed. The width of a stall affords ample space for rack, manger, and water-basin, on the same level.

These fittings should be strong, and securely attached to the wall at a height of from $3\frac{1}{2}$ to 4 feet from the ground. On each side should be a strong ring, through which the head-collar rope (if it be a stall) passes, as all horses ought to be fastened by a rope on each side of the head-collar.

DOORS.

The entrance to stables should be wide and high. Low and narrow doorways are very dangerous, because of the injuries they cause to the head and haunches. They ought to be at least eight feet high and five feet wide, the angles being well rounded, and there being no projections. The doors

should open outwards, if possible, and have an appliance for fastening them against the wall when necessary; or they may be made to slide to the side, which is, perhaps, the best arrangement.

The same remarks apply to loose box doors.

They should not allow draughts of air to fall upon the legs.

GENERAL FITTINGS.

Locks, bolts, handles of doors, hooks and pegs, etc., should be strong, and so made and placed as not to be likely to cause accidents to the horses. Harness should, if possible, be kept in a harness-room, and such implements as forks, shovels, etc., ought not to be left in the stable.

DETACHED LOOSE BOXES.

Though loose boxes inside stables may be advantageously adopted for healthy horses; yet for those which are sick, or convalescent, they are not so well adapted, as the animals do not receive such pure air, nor can they be kept so quiet. The best boxes for this purpose are those which are detached, and have a favourable aspect—southerly or south-westerly. They need not measure more than twelve or fourteen feet square, and about the same in height. The floors may be the same as those of stables, and likewise the doors. It is usual to have the latter in two portions, divided across, the lower half being about three and a half feet in height, both portions opening outwards. To prevent accidents by the horse jumping over the lower half while the upper is fastened back, a movable bar, placed at least eighteen inches above the lower part, should be used when it is desired to allow the animal fresh air and sunlight.

TEMPERATURE OF STABLES.

No fixed temperature can be maintained in stables; but, if possible, it should be kept at as near a medium degree as possible, not descending below 50°, nor exceeding 65° or 70°. Horses can endure a tolerably high range of temperature without injury in the open air, but in stables this nearly always implies a foul, sickly atmosphere, with a tendency to lung congestion, coughs, digestive derangement, feverishness, and other unfavourable conditions. Better a cold stable than one too hot. Food and clothing will keep the body warm; the lungs should have cool air.

CHAPTER IV.

FEEDING AND GENERAL MANAGEMENT.

THE subject of food and feeding of horses is necessarily one of great importance, from an economical and utilitarian point of view, and constantly presses itself upon the attention of the horse-owner and attendant, the rider or driver.

In a natural condition, the food of the horse is grass in a more or less ripe or growing state; and there can be no doubt that upon this diet the animal is maintained in the healthiest form, and is least liable to diseases—especially those of a feverish or inflammatory kind; while he can perform a certain amount of slow labour, the extent of this depending much upon the kind of grass, its stage of growth, the climate, and other circumstances.

But when stabled, treated artificially, required to undergo severe or long-continued exertion, and to exhibit qualities and resources which could not be developed in the horse roaming at large on the grassy plain, then food of a more concentrated and nutritious quality is demanded, and this has to be given in a regular and systematic manner, in quantity proportionate to the demands made upon the system, and to the requirements of health. In this state, also, regard must be paid to individual peculiarity, age, condition, season, and some other points. Some horses, like men, require more food to enable them to accomplish a certain amount of work than others; young growing animals must have materials for their develop-

ment, as well as to compensate for the waste of tissue caused by work; while more food is needed in cold weather, when the body is exposed to rapid abstraction of heat or vicissitudes of temperature, than in a warm, genial season.

A horse in poor condition will also demand a larger supply of food in order to perform a given amount of labour than one which is already in good training.

But there is a limit to the amount of food that can be profitably utilised in the body, and though the amount will correspond to the exertion that may be exacted, yet there is a limit also to this.

One horse will do more work than another; but when the work is excessive in either, the wear and tear cannot be fully compensated for by even the most nutritious food in excess. When food is allowed in quantity and quality beyond the requirements of health and labour, then it is not only wasted, but predisposes to inefficiency and disease.

The secret of feeding is, then, to feed on such food in such a manner, and in such quantity, as will maintain the horse in the most perfect health possible, having regard to the service required of it. A certain amount of nutriment must be given to keep the machine going satisfactorily under ordinary conditions; when the strain is greater, then the amount should be increased, else we shall have waste without replenishment, and premature wearing out.

Food should consist of the two principal constituents which are required to sustain the body; one of these is the albuminous or nitrogenous, needed for building up the muscular and other tissues and repairing the waste of these; the other is the starchy or fatty matter, which is chiefly burned up in the body to maintain the animal heat. A combination of these two principles is necessary in all foods, but their relative proportions vary considerably in different kinds of food, and even in different specimens of the same kind; in some the flesh-

producing or nitrogenous predominate, and in others the fat or non-nitrogenous. In addition, in the various foods of the horse there are woody fibre and cellulose, and salts of several kinds, which play an important part in the body—such as common salt, phosphates and carbonates of lime, potash, iron, etc. Water is also a constituent which varies in quantity in a very wide degree.

The following table, drawn up by Hunting, shows the constituents and their proportions in some of the kinds of food usually given to horses. The last two columns are added by Reynolds, for the purpose of showing the market value of each article of food in such a city as Liverpool (though the price is always more or less fluctuating), and also the relative cost per unit of flesh-forming material contained in each article.

Articles of Food.	Water.	Woody Fibre and Cellulose.	Fat or Heat-Producing Matters: Starch, Gum, Sugar, and Fat.	Flesh-Forming or Nitrogenous Matter.	Ash or Salts.	Value per 100 lbs.	Approximate Cost of each Unit of Nitrogenous Material.
						s. d.	d.
Beans, cleaned ...	14·5	10·0	46·0	26·0	3·5	7 4	3·4
Egyptians	—	—	—	—	—	—	—
Oats	11·8	20·8	52·0	12·5	3·0	7 4	7·0
Barley...	13·2	13·7	56·8	13·0	3·3	6 6	6·0
Maize	13·5	5·0	67·8	12·29	1·24	5 10	5·6
Hay, good Clover	14·0	34·0	43·0	5·0	5·0	5 4	12·8
Carrots	87·5	3·0	9·0	1·5	·8	2 8	21·0

The nutritive value of a large number of articles of diet consumed by the horse is given in the following table, which is very useful in enabling a person to arrive at a conclusion with regard to different kinds of feeding, as well as the quantities of each article which should enter into the ration, according to the requirements of the animal.

Articles of Diet.	In 100 Parts.					
	Water.	Albuminates.	Fats.	Carbo-hydrates.	Cellulose.	Salts.
Grass before blossom ...	75·0	3·0	0·8	12·9	7·0	2·0
Grass after blossom ...	69·0	2·5	0·7	15·0	11·5	2·0
Red Clover before blossom	83·0	3·3	0·7	7·7	4·5	1·5
Red Clover in full blossom	78·0	3·7	0·8	8·6	8·0	1·7
Lucern, very young... ...	81·0	4·5	0·6	7·8	5·0	1·7
Lucern, in blossom	74·0	4·5	0·7	7·0	12·5	2·0
Meadow Hay, medium quality	14·3	8·2	2·0	41·3	30·0	6·2
Meadow Hay, best quality	14·59	10·11	2·34	40·90	25·52	6·54
Red Clover Hay, full blossom	16·7	13·4	3·2	29·9	35·8	6·2
Lucern (young) Hay ...	16·7	19·7	3·3	32·9	22·0	5·0
Lucern (in blossom) Hay	16·7	14·4	2·5	22·5	40·0	6·4
Wheat Straw	14·3	2·0	1·5	30·2	48·0	5·5
Rye Straw	14·3	1·5	1·3	27·0	54·0	3·2
Oat Straw...	14·3	2·5	2·0	38·2	40·0	5·0
Barley Straw	14·3	3·0	1·4	32·7	43·0	7·0
Bean Straw	17·3	10·2	1·0	33·5	34·0	5·0
Oats	14·3	12·0	6·0	60·9	10·3	3·0
Barley	14·3	9·5	2·5	66·6	7·0	2·6
Barley, Indian...	12·90	11·46	1·25	65·3	7·0	2·09
Maize	14·4	10·0	7·0	68·0	5·5	2·1
Maize, Indian	12·90	9·23	1·59	68·0	5·0	1·66
Peas	14·3	22·4	2·5	52·3	9·2	2·5
Peas, Indian	12·70	25·20	1·10	58·38		2·5
Beans...	14·5	25·5	2·0	45·5	11·5	3·5
Rice	14·6	7·5	0·5	76·5	0·9	0·5
Linseed	11·80	21·70	37·0	17·50	8·0	4·0
Millets, Indian, Madras ...	12·40	10·14	2·20	73·37		1·89
Millets, Indian, Bengal ...	12·0	12·60	3·62	70·43		1·35
Millets, Indian, Bombay..	12·0	9·5	2·15	74·71		1·63
Bran	13·1	14·0	3·8	50·0	17·8	5·1
Carrots	85·0	1·5	0·2	10·8	1·7	1·0
Linseed Cake	12·4	27·3	12·8	34·5	6·5	6·1
Cotton, whole seed	11·3	23·7	6·2	31·0	21·2	6·5
Cotton, decorticated ...	9·3	41·2	16·0	16·4	8·9	8·0

The third column of the first table, and the third and fourth of the second, furnish a representation of the constituents

which, when introduced into the system, are transformed by the process of mastication, digestion, and assimilation, into material for the maintenance of animal heat, and to repair waste caused by the unceasing functions of respiration and transpiration. A portion of any excess in this class of constituents taken with the food is stored up in the form of fat, to be re-absorbed and appropriated whenever there is a deficiency in the supply of non-nitrogenous matter to meet an existing demand for it. The fourth column in the first, and second column in the second, representing the relative proportions of muscle-forming material in feeding stuffs, possess especial interest to the horse-owner; for upon a due supply of nitrogenous matter in a form capable of being assimilated, the reparation of nervous and muscular waste, and the function of general nutrition, alone depend. Unless the food contains a sufficient proportion of these substances, the body must be inefficiently nourished, and physical strength diminished, even if all the other elements of food are abundantly supplied. Unlike the elaborations of starch and fatty matters, an excess of nitrogenous material cannot be stored to meet future demands, any superabundance being removed from the body by the various processes of excretion. Should an excess of this material be given for any length of time, and no requirement for it be created by corresponding increase of work, disease must result.

The woody-fibre or cellulose contained in varying proportion in different kinds of provender, although possessing in some degree a composition similar to the non-nitrogenous constituents, cannot be considered altogether as aliment. Its function in the animal economy is to stimulate digestion and separate the richer particles of the food. The ash and salines furnish material for renewal of the bodily frame, and assist in the elaboration of secretions.

The amount of food constituents needed to maintain the functions of the body in proper working order, without the

animal being required to undergo any extra exertion, has been variously computed; but it is now pretty well ascertained that the essential diet for a horse, in a state of quietude, for twenty-four hours, should be made up as follows:—

Albuminoids	8·36 oz.
Fats	3·19 oz.
Carbo-hydrates	11·4 lbs.
Salts	·5 oz.
Being a total of Food, free from water, of ...	12·472 lbs.

This is calculated to possess potential energy capable of producing force equal to 27,855 foot-tons. And if the weight of the horse is estimated at 1,000 lbs., he would require 87·3 grains for each pound of body weight; or the whole body would require about 1·80th part of its weight in food every twenty-four hours, the animal undergoing no toil of any kind. A pony weighing 440 lbs. requires forty-six grains of nitrogenous material for each 2 lbs. 3¼ oz. of weight.

This essential diet is supposed to be theoretically totally devoid of water, but in reality it would contain from fifteen to twenty per cent. of that fluid; so that, to allow for it, something like 1·87 lbs., or 2·49 lbs., must be added to the 12·472 lbs. just referred to. Such is the subsistence ration, with its heat-forming and energy-producing constituents, which will maintain the vital powers of a horse in a normal condition for a day. The additional food required to enable the body to perform what may be called "external work," in contradistinction to that performed within the body, and which may be designated "vital" or "internal work," must depend upon circumstances, such as the amount and severity of the labour, and the conditions in which it is performed, as season of the year, locality, etc.

The weight of the horse, it may be noted, does not give us

an exact estimate of the amount of food required, as the smaller the animal the larger are his requirements in proportion, there being a larger expenditure in the latter than the former, because of the vital activity being greater, owing to the comparatively more extensive surface exposed.

Horses will perform a certain amount of slow work on hay alone, as it is a typical food for herbivorous animals, the substances required by the body existing in it in the best proportions; but to do this a large quantity is needed, as for a moderate-sized horse from 18 lbs. to 20 lbs. of hay are demanded as essential diet (*i.e.*, to perform "internal work") for twenty-four hours.

But, as has been stated, hay alone will not suffice—unless in such quantity that its bulk would prove injurious for heavy work; and by a mixture of foods we can supply a better diet, and one which will meet all requirements. Indeed, it has been asserted that a cheaper and quite as nutritive "essential" diet for a horse than 20 lbs. of hay is one composed of $11\frac{1}{4}$ lbs. of hay and $6\frac{1}{2}$ lbs. of straw.

The amount of "variable" diet for working horses depends upon the degree of labour performed, and the kind of labour; if this be slow and prolonged, there is less waste of energy and of tissue than when it is brief and severe. It has been calculated that the useful work of a horse, which would be represented by 100, with a velocity of two miles per hour, would not be more than 51, with a velocity of $7\frac{1}{2}$ miles, or more than 7, with a speed of $11\frac{1}{2}$ miles an hour. This calculation is supported by the fact that the amount of food necessary for slow work for ten hours will not suffice for more than five hours' exertion at a trot. With increased speed in work, there is an increased demand for nitrogenous substances; and in a trot or any fast pace it has been shown that for each 7,233 foot-pounds of energy expended, $15\frac{3}{4}$ to 24 grains of albuminoids must be allowed.

In calculating the diet for exertion, it has been estimated that work at a walk requires from $6\frac{3}{4}$ grains to 9 grains of nitrogenous matter for 7,233 foot-pounds of work performed; and that work at a trot or fast pace demands from $15\frac{3}{4}$ grains to 24 grains for every 7,233 foot-pounds of work.

With regard to the amount of force exerted by horses during labour, which it is important to know in order to judge of the quantity of food required, it may be mentioned that a one-horse engine working for ten hours per day raises 19,799,360 pounds one foot high—this being the calculated amount of energy expended in ten hours if it could be all at once exercised. But this is probably much more than a horse could exert; a very hard day's work would in all likelihood not be more than 16,400,000 foot-pounds, which would be exercised by a horse pulling a load along at a walk for eight hours. Eight hours' slow walking, with a traction force of 100 lbs., is equal to 8,436,571 foot-pounds per diem. Slow farm work is equal to 11,211,000 foot-pounds a day. With regard to fast work, the amount of foot-pounds raised is less, for the effort required is sudden, and the waste of tissue or force is consequently greater. The actual amount of work done is less, for the reason that the animal cannot sustain the effort, and owing to the greater waste incurred more food is needed. A Paris omnibus horse is calculated to expend 4,377,433 foot-pounds per diem; in a mail-cart the amount was found to be 5,786,000.

But it is evident that work both at a trot and walk must vary considerably, depending upon the speed, and also the weight carried or drawn. However, it has been suggested that the following estimate is fairly correct:—

A hard day's work for a horse at a walk would be	11,500,000	foot-pounds.
A moderate day's work, ditto	8,500,000	,,
A hard day's work for a horse at a trot of fast pace would be	7,233,000	,,
A moderate day's work, ditto	3,500,000	,,

The following table shows the amount of food required by a horse under different conditions of labour, the proximate principles of the diet being given :—

Proximate Principles.	Moderate Work.		Active Work.		Severe Work.	
	lbs.	oz.	lbs.	oz.	lbs.	oz.
Albuminoids	1	4	1	8	2	0
Fats	0	8½	0	10	0	12½
Carbo-hydrates	6	13	6	0	10	0
Salts	1	5	1	7	1	9
Total	9	14½	9	9	14	5½

It must be remembered that the above quantities are only approximate. Ten pounds of carbo-hydrates would in all probability not be consumed by a racehorse—perhaps not more than two-thirds of that amount; yet a large waggon-horse, subjected to severe labour, would consume fully that quantity. And, as has been already hinted, the animal body is not a mere machine which only requires an increase in fuel to develop an increase of power for work; for there is a limit to absorption and assimilation of the pabulum, this being smallest for fats, next for albuminates, and largest for carbo-hydrates. If the work imposed upon a horse is larger than his system can sustain, even where the food allowed is unlimited in quantity, this will not permit him to undergo the toil without injury. A horse will succumb to overwork, however well he may be fed.

DIGESTIBILITY OF FOOD.

The digestibility of foods is an important consideration in feeding, as with some kinds more is absorbed into the system than others. With scarcely any of them is digestion complete throughout, a portion always being thrown out of the body undigested, no matter what amount of preparation it may have undergone.

With regard to this point, it may be remarked that age has an influence on the digestibility of plants and herbage. Thus, hay cut as soon as ripe is digested more easily than at a later stage of growth, and it is the same with clover. When young, plants contain more albuminoids, and less woody fibre or cellulose, than when old. Roots, however, such as carrots, turnips, potatoes, and mangolds, have their nutritive value increased by age, since the production of the carbo-hydrates—as sugar and starch—increases with growth.

Food containing a large amount of nutriment in small bulk is usually digested better than hay or straw. This is particularly the case with the albuminoids and fats contained in them; 85 per cent. of beans and 80 per cent. of linseed are digested as easily as 64 per cent. of hay and 45 per cent. of straw. The more nitrogenous the hay and straw, the better it is digested. Only 20 per cent. of wheat straw is digested, against 76 of lucerne hay. What is called "cellulose" is usually fairly well digested. Hay and straw of leguminous plants, as peas and beans, are not so easily digested as that of the cereals, because more woody matter, which is indigestible, is contained in the former than the latter. With wheat-straw chaff, it has been stated that about 22 per cent. of the total organic matter in it is digested.

It would appear that only a certain amount of each substance can be digested from a given quantity of food, and rest or work will not cause an animal to digest more, though it may happen that two animals of the same breed will digest different quantities of the same food.

The digestibility of one food may be increased by the addition of a second or third different kind, and a decrease in digestibility may be effected in the same way. Small quantities of oil added to a diet of hay and straw will slightly increase their digestibility; but the addition of sugar or starch, if it exceeds 10 per cent. of the diet (both being dry), diminishes the

digestibility, the albuminoids and cellulose not being digested to the proper amounts. An excess of starch is more to be feared than an undue proportion of sugar in the digestion of hay.

More or less preparation of food will increase facility of digestion, so long as it does not alter the character of its constituents or impair the digestive process. Crushing grain which is covered by an insoluble husk, or is so dense that the gastric juice acts slowly on it, is to ensure its easier digestion in the stomach, should it escape crushing by the teeth in the act of mastication. Therefore it is that oats and barley are more nutritious crushed than whole; as if a portion misses the crushing action of the molars, it is almost certain to be voided unaltered from the animal. So it is, also, that the seeds of maize and beans are better for feeding when broken into pieces than when given whole. Even hay and straw may be rendered more digestible when cut up or "chopped" than when allowed whole, as it is then more easily mixed with the saliva and the gastric juice, and the animal is spared much of the fatigue of mastication. Some legumes even require to be boiled to render them digestible; and potatoes are better boiled or steamed than given raw, as in the latter state they are likely to give rise to intestinal irritation.

The condition of the horse has also a good deal to do with the digestion of food. A healthy, vigorous animal can digest much more food, and quicker, than a weakly one; and a sick horse may have its digestive powers seriously enfeebled, while hardship or fatigue may have a similar effect.

CONDITION OF FOOD WITH REGARD TO QUALITY.

The condition of the food may likewise alter its facility of digestion and nutritive properties, this depending upon its mode of growth, care in collecting and preserving, cleanliness, and freedom from animal and vegetable parasites. If the land

on which the food is grown be poor in quality, the produce will be in a similar condition; it will be poor in its chemical constituents, particularly those on which its nutritive value depends. Oats, manured with cows' dung, will produce sixteen bushels for every bushel of seed sown, while on unmanured land there will be only five bushels produced for every bushel of seed. The formation of the soil affects to a considerable degree the produce and quality of the food. Oats reared on clay land are superior to any other. Rye flourishes better on a light, sandy soil. A stiff clay produces a coarse barley; a light chalk a light grain; and a loamy land a full, plump grain; these are only a few examples of many which might be quoted. The time of cutting influences the nutritive value of a food; hay cut late has lost much of its properties; if cut too early it is prevented from reaching the full extent of its nutritive matters. Wheat cut about a fortnight before it is ripe contains the most starch and gluten; the bushel weighs heavier, and the straw contains its greatest nourishment; cut late, the ear contains more cellulose, consequently an increased production of bran, and a diminished proportion of flour.

The season affects the quality of the forage; for instance, in very wet years, and especially when lands have been flooded, parasitic diseases of plants are most common. The age of grain and forage, up to a certain time, enhances their value and quality. Old hay is preferable to, and more valuable than, new; and the same applies to oats, beans, wheat, etc. Food badly saved and stored undergoes deterioration, which may range from slight diminution in nutritive principles, or sourness, to mouldy, decomposing, and offensively smelling material.

CLEANLINESS OF FOOD.

Cleanliness of food is important, as that which is dirty may cause indigestion, colic, serious disease, or even death. Sand, earth, or gravel, when taken in with the food, is generally

retained in the large intestines, accumulating until there is sometimes a very great quantity. Horses fed on dusty food, such as the sweepings from grain-mills, or with that which contains husks of oats, often have large calculi, or what are called "dust balls," form in the intestines, which very frequently cause rupture, obstruction, or strangulation of these. Even a small pebble, small nail, or scrap of metal, gaining access to the intestines with the food, may form the nucleus for one of these accumulations, stones, or "concretions."

Hay or grain may be unclean from bad preservation or gathering, or even when growing. The most frequent cause of uncleanliness in this respect is the presence of moulds of various kinds, which not only diminish the value of the food in nutrition, but may even prove injurious or poisonous to the horses consuming it. The most common sources of damage to growing plants or grain are the parasitic fungi, commonly known as "Bunt," "Rust," "Mildew," "Smut," and "Ergot."

"Bunt" grows on grasses, straws, and grains; but it chiefly attacks the head of wheat, which it destroys, replacing the flour by a dark powder with a fish-like smell. When it affects the stalks and leaves, these become pale, dry, and shrivelled up.

"Rust" appears as a reddish-yellow powder on the grasses, and on the stalk, leaves, and flowering heads of plants, and it more or less destroys them.

"Mildew" shows itself as brown or black spots that are really parasitic spores, which penetrate the plant, and change the part into a black powder.

"Smut" grows in large black clusters, somewhat like soot, but solid, on grasses and grain-plants, causing them to look sickly, bleached, and eventually killing them.

"Ergot" grows on grasses and grain-plants, in the form of a cock's spur or horn-shaped body, dark purple in colour, and unpleasant in odour.

Mouldiness is usually produced by faulty preservation or storing, and is due to the presence of various kinds of microscopical fungi, which, damp or wet having removed many of the nutritive elements of the hay or grain, completely destroy forage if allowed to grow on it unchecked. It appears as a fine dust, or black, bluish, or brown patches, according to the kind of mould. Mouldy hay, if dry, breaks readily, and when shaken gives off what appears to be dust, but which is really the spores of the fungus, and which are very irritating to the eyes, nostrils, and throat.

Forage damaged by these moulds is not only less nutritious than clean forage, but it is more or less indigestible and injurious, causing loss of condition, colic, constipation, diarrhœa, inflammation of the intestines, diabetes, skin disease, paralysis, and sometimes abortion in breeding animals. Mouldy oats have been known to kill horses fed on them for only a short time.

Insects, very minute in size, also damage forage, but not at all to the same extent as the parasitic fungi.

CHANGING FOOD.

Care is often necessary in changing from one kind of food to another kind. A change from dry to green food, if sudden, is very likely to cause diarrhœa ; and even imperfectly dried, or new hay, will often do this, especially with hard-worked horses, or those required to go at a fast pace. A sudden change from oats to barley, from a poor to a rich diet, or from an easily digested to a dry, indigestible food, is to be guarded against. Changing from oats to wheat is especially to be carefully done, or serious damage will ensue ; indeed, wheat for horses is at all times a dangerous diet.

DIFFERENT KINDS OF FOOD.

The grass family furnishes by far the largest number of articles consumed by animals as food, for however diverse in

external aspect hay, oats, wheat, maize, barley, rice, rye, and millet may appear, yet they all belong to the genus *graminaceæ*, though there are plants generally regarded as grasses—as the clovers and sainfoin—which in reality do not belong to them. The grasses, notwithstanding their wide geographical distribution, are remarkably uniform in structure, the greatest diversity being in their height; though it may be noted that the British grasses are only annual, while those of warm climates are often perennial.

Hay.—Grass and dried grass, or hay, represent a typical food for the horse, upon which he can subsist, become fat, and even perform a certain amount of slow work without any other kind of subsistence. Grasses are divided into natural and artificial. The former are true grasses, and the artificial include the clovers, sainfoin, lucerne, etc.—plants which are really not grasses. The natural grasses comprise upland, meadow, and water-meadow grass; though this is rather an arbitary division, as many grasses which grow on uplands are also to be found in meadows. The soil upon which the grasses grow considerably influences their value for feeding purposes; on rich soils the pastures are more permanent, but the produce is better for rearing and feeding animals; but on poor, light soil the grass is difficult to maintain, and indifferently nutritious.

Grass in its natural state is not usually given to horses in the United Kingdom, as it is more convenient and useful to give it in a dried condition—*i.e.*, converted into hay; for though in warmer climates horses can perform a fair amount of work on it, yet here it has not the same amount of sustenance, and if it is young is liable to act as a laxative or purgative.

Water-meadow hay is not good for horses, and contains aquatic plants. Of the meadow and upland hay, the latter is considered the best. It is short, fine, has a pleasant odour

and taste, hard and crisp stem, and is generally mixed with some of the artificial grasses, as clover. Its colour varies according to the way in which it has been prepared, though it rather inclines to green. In good upland hay the flowering heads of the grasses should be plentiful. Meadow hay is long, the stems rather hard, though in indifferent samples they may be soft. Compared with upland, it is coarser, darker in colour, and the aroma stronger, but this generally depends upon its preparation ; the taste, owing to the coarseness of some of the grasses, is not so sweet. It generally contains a number of other plants besides the grasses.

It may be mentioned that the water-meadow hay is hard, long, coarse, and tasteless, without aroma, and full of water-plants. It is a very poor feeding material.

The value of hay depends much upon the mode of growth and the time at which it is cut, as well as the way in which it is preserved.

That made from grasses growing in sheltered places—as under trees and hedges—is insipid, and little worth as food ; and all hay cut too late—after it has seeded—is less nutritious than when cut at the proper time.

The best hay is one year old, of a rather greenish tint, firm and long, clean, sweet to the taste, and of a pleasant characteristic odour. An infusion from it (hay tea) should be of a good dark colour ; in the truss, flowers are found in it which still retain more or less of their tint. A large variety of good grasses are contained in it, and an abundance of flowering-heads.

Hay of medium quality, if old, is tasteless, brittle, and dusty ; or if affected in quality from other causes, is short and fine, deficient in variety of grasses ; or short, coarse, and dark in colour, odourless, taste perhaps pungent, and weeds sometimes present.

Hay of bad quality is mouldy, brittle, bad-smelling, perhaps

dark-brown in colour, and innutritious. If composed of water-meadow grasses, these are seen in abundance, giving a great coarseness to the hay, which is deficient in colour and aroma.

Hay of medium and of bad quality are often found together, but they should be considered as distinct, as there is a hay of medium quality which, though unsuited for hard-worked or valuable animals, is yet useful for a certain class of horse, as it does not contain anything injurious, but simply, either through a bad season, bad sowing, or being a second crop, is destitute of the nutriment contained in the best quality, having none of those hurtful properties, however, found in bad hay. Again, hay originally of the best quality will, if kept too long, lose much of its nourishment, and become second-class forage.

Hay when less than one year old is termed new, and though horses like new hay, experience has shown that it is not good for feeding purposes, being likely to cause purging and abdominal pain; indeed, it is considered as innutritious. If it must be used, it should be given only in small quantities, and mixed, if possible, with old hay. It is preferable to give overripe, or even slightly weathered, hay, rather than that which is green and juicy.

Old hay is so called after its first year, and it generally retains its full nutritive properties for one year more; but, as a general rule, hay deteriorates and becomes dry after being stacked longer than eighteen months. Exceptionally, however, when grown upon good soil, mown, and gathered under favourable conditions, it is often after that age more nutritious than the succeeding year's crop.

New hay is distinguished from old by its green colour, more powerful aroma, the fibres containing sap, particularly at the joints, and by its being softer than old hay, which enables it to undergo more twisting without breaking. A truss of old hay, for the same weight as a truss of new—56 lbs.—is less in

bulk, owing to the amount of consolidation which has taken place in the rick.

The second or third cutting of hay is termed the "aftermath." It is greener than the first crop, softer, contains weeds and roots, no flowering heads, and the aroma is less marked than in good hay, even if well got; but badly harvested it is entirely destitute of perfume; owing to the lateness of the crop and the amount of moisture it contains, it is very difficult to harvest properly; as a rule it is only fit for cattle. When the grass is cut, it should remain in the field as short a time as possible; as if left in the sun too long it loses its colour and flavour, and becomes dried up; the difference of an hour on a hot day is said to occasion a loss of fifteen to twenty per cent. in the hay. If exposed to rain, much of its valuable nutriment is washed out of it. The peculiar aroma of hay is due to a volatile compound, some say to the sweet-scented vernal grass; in badly saved hay this aroma is destroyed.

In England the greatest care is exercised to preserve the colour and aroma, and this is secured by repeated turning and rapid drying; in Scotland, where little natural hay is made (that principally produced being from clover and rye grass), less turning is done, the crop is allowed to remain a number of days on the ground, and when gathered it does not ferment. Consequently, Scotch hay bears an indifferent name. For the same reasons, Irish hay is poor in quality; even more so than the Scotch, being left a longer time in the fields.

When hay is stacked in large quantity, it undergoes a certain amount of "heating," or fermentation, which improves its flavour and nutritive qualities; but if this heating is carried beyond a certain point, it causes damage. Hay ricked in a damp or wet state does not heat, but becomes mouldy and rotten. A rick should remain untouched for one year.

Hay may be badly harvested, dusty, mow-burnt, mouldy, or musty. In badly harvested hay the damage may be slight,

caused by a shower of rain; or the hay may be bleached, sapless, and deficient in aroma, the result of being exposed to bad weather. When slightly damaged, such hay may be given as food; but when affected to any extent, it is only fit for bedding. Hay is made dusty from exposure to bad weather, or to the sun, or it may be due to decay. "Mow-burnt" hay is the result of undue fermentation in the stack, its colour being changed from brown to a very dark brown, almost black, the hay itself being dry and brittle, with a very pungent taste and powerful odour. When only slightly mow-burnt, horses do not dislike it, as it is sweet, owing to its containing a large amount of sugar, while the aroma is pleasant; but when badly burned, the sugar has become converted into acetic acid, has to a large extent lost its nutritious properties, and causes derangement of the digestion. Horses soon become tired of mow-burnt hay, which acts as a diuretic, and if continued for any time produces excessive thirst, loss of condition, listlessness and weakness, and the animal is in a condition to contract serious disease. "Musty" hay is that which has been exposed to wet and damp, either in the rick or before being stacked; mould is more or less abundant on it, the odour is unpleasant, and it has a bitter taste. It should never be given as food if possible, as it is liable to produce disease; if it must be given, it should be in small quantities, after being dressed with a solution of common salt, or it should be exposed to steam at a high temperature.

The artificial grasses which are made into hay are chiefly red and white clover; Swedish, Italian, and yellow clover; vetches, lucerne, and sainfoin. When these artificial grasses are converted into hay, the proportion of albuminoids per cent. is nearly equal to that of oats, and much greater than in the natural grasses, though they contain less fats, carbo-hydrates, and phosphates; the flesh-producing elements in clover are given as 13·52 for clover and 8·44 for meadow hay. The artificial grasses are too rich to be given alone in large quantity, as

"broken wind" and indigestion, as well as liver disease, have been attributed to them. They should therefore be given in small quantity, or mixed with hay. Owing to the amount of moisture in clover, there is great difficulty in converting it into hay; consequently, it is liable to become mouldy and rank, and therefore liable to produce disease of the bowels, etc. The trefoils are said to contain a very active principle very irritating to the kidneys. The amount of artificial forage which may be given to horses with safety will vary according to circumstances; in the green state, it should be used sparingly, especially with horses which are brought on to it for the first time, as it is liable to undergo fermentation in the intestines, and cause extreme distension. In the form of hay, owing to its highly stimulating qualities, a sparing use of it should be observed; one-third of this forage to two-thirds hay would be a judicious mixture for ordinary use for horses not performing hard work. Lucerne is a valuable food, when green, for sick horses; it should, however, be half dried in the sun before use, if possible. When made into good hay, it is very good feeding, mixed with the ordinary ration.

Oats.—Oats are generally considered the best grain food for horses. Good oats are heavy, have a thin skin, and are clean, hard, sweet, and free from musty smell. Ordinary oats usually contain about 30 per cent. of innutritious husk; and light oats, weighing less than 40 lbs. to the bushel, contain a larger amount of husk than heavier oats. White oats are generally thinner in the skin than black. Very good oats will weigh from 42 lbs to 48 lbs. per bushel; but under 40 lbs. they are not of much value for hard work, unless given in larger quantity. Kiln-dried oats are objectionable, inasmuch as the flour in them is more or less damaged, either in the process of drying or before they have been put on the kiln. Foreign oats, however, are generally slightly kiln-dried, even when in good condition, before being put on board ship, with a view to

prevent their heating during the voyage. Oats, also, which have been badly harvested, or become dirty from any cause, are sometimes washed to improve their appearance, and then dried on the kiln. New oats are also sometimes slightly kiln-dried to make them hard, resembling old oats, and thus increase their value. When so dried, oats have a peculiar smell and taste, and a wrinkled appearance about the ends of the husks, owing to the shrinking of the kernel; the colour is also deeper, and sometimes reddish in tint. What are called "foxy" oats are oats which have heated in bulk when not perfectly dry, and undergone fermentation to some extent. They have a pink or very red colour, an unpleasant smell, and a bitter taste. When given to horses they act injuriously upon the kidneys, causing diabetes and loss of condition. Damp oats are generally recognised by their softness, mustiness, or mouldiness, or sprouting, depending upon the amount of damp, the period of exposure, and whether the oats are in bulk. If merely soft, no great harm is done, but if they have a musty smell, or show mould, then they are unfit for food. Sprouted oats should not be given for food. Oats may be mixed with stones, dirt, or any foreign matter, as well as the small seeds of weeds. These should be got rid of by winnowing. New are chiefly distinguished from old oats by the smell, which in the former is rather earth-like; the husk of the new oat is also bright, while its taste is sweet and milky; it is likewise softer than the old oat.

Maize.—This has now become a very common diet for horses, especially for those doing moderate and slow work. Compared with oats, it contains more heat-forming, and rather less flesh-forming, elements. The difference between the price of the two is generally in favour of maize, and influences its use on economical grounds. It should be at least a year old and clean. New maize is distinguished from old by its softness. In this country it is usually given combined with

oats, as when horses are fed upon it alone, it is considered too heating.

Barley.—Barley is generally too expensive in this country for horses. If used at all, great care must be observed, as it is liable to cause derangement of digestion, and irritation of the bowels and skin.

Rye.—Rye is better and safer than barley, but inferior to oats.

Beans.—Beans constitute an excellent ingredient in the feed of horses doing very hard work, as they contain more nutritive and stimulant matter. English beans for feeding should be one year old, weigh from 60 lbs. to 64 lbs. per bushel, and be hard, full, sweet, and free from perforations caused by insects which devour the kernel. The skin should be thin, and easily removed. Egyptian beans are largely used because of their lower price; if they are clean, dry, and sound, they are not very inferior to English beans.

Peas.—These have somewhat the same composition as beans, and are, therefore, almost equally nutritious; being weight-for-weight cheaper, they are often substituted for these. They should also be at least a year old, sound, clean, and free from perforations.

Bran.—This can scarcely be looked upon as an article of substantial diet, as owing to the improved wheat-dressing machines, very little nutritious matter is allowed to adhere to it. It is, however, often given as a laxative to sick horses, or those which are resting; and it is palatable and refreshing. It should be dry, free from mould, sweet-tasting, and clean.

Linseed.—This is not usually given to healthy horses, but for patients. It is employed in the form of mucilage, tea, or gruel. Linseed-cake water is sometimes used to moisten manger-food, when this is of a constipating nature, and with advantage. It has been recommended that in large

establishments the cooking-house should have a trough for the preparation of this fluid.

Carrots.—These are the best of all roots for horses, and especially for hunters and others performing hard work, as well as for unthrifty horses. Indeed, were it not for the high price, they might be recommended for all horses.

Turnips and Mangolds.—These, when of good quality, are useful adjuncts to the food of horses standing idle, or doing little work in winter. They are best given raw and pulped.

Potatoes.—Where these are largely cultivated they are often given to horses as an article of diet, especially when more or less damaged by disease. Though they possess only a small amount of flesh-forming material, yet they are supposed to be about one-third as nutritious as oats, and when steamed or boiled, mixed with chopped hay and straw, and a small proportion of oats, they are found capable of maintaining horses, doing slow work, in good condition.

Green Forage.—During the season green forage is frequently given to horses as part of their diet, even when performing moderate work; but grass, when very succulent, and especially that which has been grown on water meadows and sewage irrigation land, is best for idle or sick horses, as, though refreshing, it contains very little nutriment. Clover, tares, and vetches are much liked by horses, and may be given mixed with their hay; when sown in spring and cut late in the summer, they are very useful, as then the pastures become bare; and for farm horses, winter tares come in useful for spring feeding on arable farms. Under all circumstances, green food, when wet with rain or dew, should not be given to horses until some of the moisture has been got rid of by drying. When green forage is given in the early spring as part of the feed ration, it should at first be allowed sparingly, and after the other food has been consumed, as horses devour it greedily; after a time it may be increased in quantity without

danger. It is usually found most economical and safe to have the green forage chopped, and mixed with the hay, chaff, and corn, especially for town horses.

PREPARATION OF FOOD.

Stabled horses, and especially those doing hard work, generally require to have their food more or less prepared, and this preparation is a matter of some importance with regard to economy and efficient feeding. No matter how perfectly mastication and digestion may succeed in extracting nourishment from unbroken and unprepared grain, the abridgment of labour and duration in these processes must be a saving to the animal; but when mastication or digestion is impaired — as in old horses when their teeth become defective, in horses overfatigued by severe labour or privation, or in those which are ill or recovering from sickness—such preparation must be doubly beneficial. Grain should be crushed at least sufficiently to break the husk; and beans, peas, and maize should not be broken into flour, but cracked or split.

Cutting hay, and also straw, when it is part of the rations, into chop, is now pretty generally adopted, especially in large studs of horses, as it prevents waste; and if the chop is mixed with the grain, it ensures complete mastication of both. It is recognised that for horses doing long and slow work, with but a limited time for rest, this preparation of the food is eminently beneficial. The easier and more thorough mastication is a guarantee that the food is well mixed with saliva in the mouth, and this renders digestion in the stomach more rapid and perfect.

With a mixture of chop and different kinds of grain, it is very necessary that the whole should be thoroughly mixed. If a number of horses are to be fed with it, in order that each may receive its due quantity of each ingredient, to facilitate

this mixing a large iron tub or box (or if of wood it should be lined throughout with sheet iron) at least one-third greater than the bulk of the food to be mixed at one time ought to be employed; the different parts of the food are laid in this box in alternate layers; when all are placed, they are then stirred up by means of a light spade.

Hay of good quality requires no further preparation than chopping; but for inferior hay, and especially if it be mouldy, the process of steaming for fifteen or twenty minutes has been recommended; this steaming, though it does not improve the nutritive qualities of the hay, renders it more palatable and digestible, and destroys whatever noxious qualities it may possess.

Roots, as carrots, turnips, or parsnips, should be carefully cleansed from earth and grit by washing; and to prevent choking, and render them more easily eaten, they should be cut or sliced into small pieces. If boiled or steamed, this should not be overdone, as horses relish them more when they are a little hard.

With regard to the propriety of boiling food, opinions differ somewhat; but for healthy horses, performing more than an average amount of severe, and especially fast, work there can be no doubt that unboiled grain, when of good quality, is better than that which is boiled. For heavy, or draught horses, Reynolds remarks that when hard or uncooked corn forms the ordinary ration, a night feed two or three times a week of steamed grain, mixed with bran, is an exceedingly good and agreeable change. At periods of the year when the demands upon team labour are moderate, the practice of steaming the corn is better for the animals, and also more economical. With a view to reducing the stimulating qualities of the diet, for horses doing only half work or less, the practice is especially good. A bushel of grain thus prepared will go as far in rendering the chop palatable as three times the quantity given raw. For young

horses during the periods of teething, as well as for old horses having defective teeth or weakened digestive powers, boiled corn is much to be preferred. Damaged grain of all kinds, if used, should invariably be subjected to the cooking process; but it should be remembered that all steamed or boiled foods must be consumed before fermentation commences in them. Boiling or steaming ought to be applied only to whole grain, and should not reduce it to pulp, as horses dislike "slops." A little salt added to such food renders it more palatable, and probably tends to keep it sweet for a longer period.

MIXTURE OF FOOD.

For working horses, it is necessary that the food consist of a mixture of different kinds; for though health may be maintained on hay or grass alone, yet whenever exertion exceeds that of mere exercise, more nutriment is required to compensate for the waste, and if hay or grass only is allowed, such a quantity of these must be consumed as will cause great inconvenience to the animal by the distension they create, while a long time is needed for their mastication and digestion. Therefore grain must be given to supplement the hay, and this in proportion to the amount of work exacted; but even a mixture of grain, when this has to be given, is very advantageous, from an economical and dietetic point of view. Thus it is found that oats, and beans or peas, and maize and oats, are more beneficial than either of these grains given singly; and a variation in their relative proportion, at intervals, is also strongly recommended. So it is that in the diet scale of large studs we often find two or three kinds of grain in the ration, in addition to the hay and straw, roots and grass.

With regard to mixture of food, the object should be to furnish what is deficient in one kind of grain by another grain which contains it in large proportions.

QUANTITY OF FOOD.

As before mentioned, the quantity of food allowed for a horse, over and above what is required to maintain health, should be in proportion to the amount of work exacted. A selection of diet having been determined upon, by a careful estimate of the relative feeding value and comparative cost of each article entering into its composition, a consideration of the quantity necessary to keep the horse in such condition as will enable him to perform his work satisfactorily and without material injury to his strength, is most important. It will be obvious that the quantity of food required will depend upon circumstances—such as the duration and severity of the work, the conditions under which it has to be performed, as well as the size, age, condition, constitution, and appetite of the animal; for it must not be forgotten that horses, like men, differ in their appetites, some being able to perform a certain amount of work on a smaller quantity of food than others.

To maintain a just balance between food and work, which the condition of the horse will pretty accurately demonstrate, the owner must be ready to increase, and as promptly diminish, the grain allowance as demands upon it are created or disappear. If the quality of the food is not sufficiently rich to furnish material for the repair of waste tissue, the deficiency must be met by the consumption of an increased quantity. But as has been pointed out, an excessive supply of comparatively innutritious food to compensate for deficiency in quality, is not only embarrassing to the stomach, but hampers the horse with bulky dead weight. Severely worked horses eat more than those which are not so strained, and should therefore be supplied with more concentrated food, easier of digestion, and rich in flesh-forming properties.

For the largest-sized draught horse which performs steady hard work for a number of hours every day, 18 lbs. of hay, and

a small proportion of straw, cut into chaff, with 18 lbs. of oats, and a pound or two of beans or peas, is reckoned a fair allowance. Reynolds states that the weight of dry food absolutely consumed by an average-sized, well-conditioned cart horse, moderately worked, regularly fed, well housed, and supplied with diet of good quality, is from 29 lbs. to 34 lbs. daily, of which the hay and straw should constitute about two-fifths. However nutritious the food may be, less than 29 lbs. will not suffice to maintain the organs in healthy action. In a stud of cart horses which he managed, the following was the daily allowance :—Indian corn, 10 lbs.; Egyptian beans or Canadian peas, 5 lbs.; oats, 2 lbs.; oatmeal and linseed, 1·3 lb.; bran, 2·1 lbs.; hay, 10·6 lbs.; roots and grass, 3 lbs.

Maize, beans, or peas, with bran and cut hay, formed the basis of the usual food allowance. The oats and linseed were used only for sick or delicate-feeding horses. The oatmeal was made into gruel, of which each horse was allowed a drink on coming to his stable when the day's work was completed.

The roots and grass were given during the months it was considered advisable to use them. In autumn and winter the corn was bruised and given raw, except a night feed of steamed food three or more times a week. In spring and summer the grain was steamed, but an occasional meal of dry food was allowed as a change. A further change both in the proportion and quantity of the grain given was also frequently made, as conditions of weather or work appeared to indicate, but the autumn allowance was always the most stimulative. The bulk of the hay was given in the form of chop with the corn, two or three pounds only being given in the rack the last thing at night. In quality the best obtainable clover hay was used. A small quantity of straw was sometimes chopped with the hay. The horses were of average size, moderately worked at equable and regular labour every day (25 per cent. were also worked for about three hours each Sunday morning), and their condition was good.

Another large company employing a number of horses performing very hard work, drawing heavily laden drags, allows forage per diem as follows:—Hay, 16 lbs.; oats, 10 lbs.; beans, 5 lbs.; maize, 4 lbs.; bran, 2 lbs.; total, 37 lbs. The hay is all chopped, and the grain crushed separately; then the whole mixed together. Every Saturday night each horse is given a mash of linseed, mixed with a small proportion of bran, boiled altogether and given warm. When the work is less, less grain is given.

For smaller horses undergoing regular, but hard, work within a brief space—such as omnibus or tramcar horses—a less allowance of food is of course given. The following is the diet allowance per day of the principal Tramway Companies in the United Kingdom. It may be observed, however, that this allowance varies according to the price of forage in the market, and also sometimes according to the season.

SCALE OF FEEDING OF VARIOUS TRAMWAY COMPANIES' HORSES IN THE UNITED KINGDOM.

North Metropolitan.	London.	London Street.	South London.	Birmingham.
lbs.	lbs.	lbs.	lbs.	lbs.
Maize ... 13	Maize ... 7	Maize ... 12	Maize ... 7	Maize ... 6
Oats ... 3	Oats ... 3	Oats ... 3	Oats ... 7	Oats ... 10
Beans ... 1	Peas ... 3	Beans ... 1	Beans ... 1	Beans ... 4
Peas ... 1	Hay ... 12	Bran ... 1	Hay ... 11	Chaff ... 12
Hay (In Chaff.) 7	Straw ... 1	Hay ... 11	Straw ... 3	
Straw (In Chaff.) 3				
Total... 28	26	28	29	32

Liverpool.	Manchester.	Glasgow.	Edinburgh.	Dublin.
lbs.	lbs.	lbs.	lbs.	lbs.
Maize ... 12	Beans, Oats, Maize 15	Oats ... 6	Oats ... 8	Maize ... 14
Beans ... 4	Hay ... 15	Maize ... 11	Maize ... 4	Oats ... 3
Cut Hay 14		Hay ... $8\frac{1}{2}$	Beans ... 4	Hay ... 12
Bran ... 1		Straw ... 1	Hay ... 14	Bran ... $0\frac{1}{2}$
		Bran ... $0\frac{1}{2}$	Marshlam 2	
Total... 31	30	27	32	$29\frac{1}{2}$

The scale of rations for troop horses is usually 10 lbs. of oats; 12 lbs. of hay; 8 lbs. of straw—the latter allowed for litter; but when the duty is severe, or when the horses are in camp, from 2 lbs. to 4 lbs. additional oats are allowed; in camp no straw is given for bedding. In all cases the hay is given unchopped.

For hunters, much will depend, of course, upon the size of the animal and the amount of work demanded from him. Large horses, say 16 hands high, doing two days a week in the field, 16 lbs. of good oats and 10 lbs. of hay is not too great an allowance; 2 lbs. of split beans might be substituted for 2 lbs. of oats with advantage; for smaller sized hunters the allowance may be less, but it can rarely be reduced below 12 lbs. per diem, with 12 lbs. of hay. For all hunters a small proportion of the hay, say 4 lbs., should be chopped and mixed with the grain; 2 lbs. or 3 lbs. of carrots may be advantageously given at intervals.

For carriage horses doing light work 10 lbs. of corn and 12 lbs. of hay are quite sufficient; in some cases 8 lbs. of corn and 14 lbs. of hay would suffice.

Ponies and undersized horses do not require so much grain, of course; indeed, for ponies, unless the work is very hard, a very small allowance of oats, say 4 lbs. per diem, is all that is required; hay and roots being often quite enough to keep them in good condition.

It is a good plan to vary the diet now and again—such as giving a bran or linseed mash once or twice a week. An important question arises when treating of the quantity of the food a horse should receive, and that is with regard to bulk. Attempts are made from time to time to feed horses on concentrated food, with the view of securing facility of transport; but it is forgotten that a certain degree of bulk is necessary in all food, in order that the digestive organs may perform their function properly. During working time food of less bulk may be given, such as oats, as it interferes less

with the breathing organs, and is more rapidly consumed; but a certain amount of bulk the horse must have at some time or other, and the best time for giving this is at night.

FREQUENCY OF FEEDING.

Next in importance to the quantity of food is the frequency with which it should be given. It should always be remembered that the peculiar anatomical structure of the digestive organs in the horse, as well as the nature of the digestive process in that animal, necessitate food being given at regular and frequent periods. Nothing conduces to health and efficiency more than the observance of the rule by which food is allowed at periods suited to the requirements of the digestive functions. Perhaps no animal suffers more from long fasts than the horse; and disease or disorder of the digestive organs is a common occurrence in stables where long fasts are succeeded by heavy feeding, as digestion is impaired by the food being devoured greedily, and in larger quantity than the stomach can properly accommodate. Horses should be fed at least three times a day; better if it could be four times. The hour at which the morning feed should be given will depend more or less upon the time for turning out for work; there ought to be ample leisure for consuming the meal before that occurs. At any rate, the first feed should not be later than six or seven in the morning; the next towards mid-day; and if only fed three times a day, the third in the evening. If possible, no longer interval than four hours should elapse between the meals; and while those given during the day should be moderate in quantity, that allowed at night ought to be the largest, as the horse then has ample time for mastication and rest. During the day a little food, however small the quantity, is better than none; and for heavy horses, and even for light ones when it can be carried, a nose-bag containing a feed is a

most advantageous addendum to the equipment. If the hay is given long or uncut, the bulk of it should be reserved for night consumption. An important point in feeding is to apportion the feeds in such a way that each will be consumed at the time it is given; as if any is left in the manger it becomes stale or sour, and the horse does not care for it afterwards. This is most frequently the case with chaff which has been wetted in the manger—a good practice, as it is easier masticated, but it has the disadvantage of spoiling any food which may be left, and also necessitates the frequent washing out of the manger.

WATER.

Water is as essential to horses as food, and unless for special reasons, they should never be stinted in it. Horses prefer soft to hard water, and clean to dirty water; whether hard or soft, it should always be clean, if possible. The quantity consumed will depend upon circumstances. Some horses drink more than others; in hot weather more is required than in cold; after severe exertion, a greater quantity is taken than when the horse is allowed to remain quiet; when feverish, horses drink more than in health; when deprived of water for a long time, more is swallowed than would have been taken had the horse been allowed to help himself voluntarily. Horses, as a rule, drink less water when they can have easy access to it, or when it is always before them, than when they only receive it at certain, perhaps long, intervals. It is, therefore, the best plan to allow them to have water frequently, even when performing fast work. If properly watered, a horse will not drink any more than is necessary for him; so that, as to quantity, he is the best judge. There are circumstances when, perhaps, it may be necessary to restrict an unlimited supply of cold water, as when he is exhausted from fatigue, after prolonged abstinence, or when very cold, or even

excessively hot. In such cases, a small quantity only should be allowed until the body is in a fit state to receive more; or the water may be given tepid, or, which is better, some oatmeal may be mixed with it, or a bucket of oatmeal gruel given instead; indeed, in all such circumstances, the latter is the safest procedure. It is a wise plan always to give water before feeding, not after; as if given after eating it is likely to cause colic, by carrying with it some of the undigested food from the stomach into the intestines. Fresh water should always be given. Water troughs ought to be kept scrupulously clean, and the water in them often changed. Icy cold water is not very safe, and if it must be given, it should be allowed only in small quantity at a time, or warm water added to it.

GROOMING.

Next in importance to food and water in stable-kept horses is grooming. There can be no doubt that the artificial state in which horses are kept renders cleanliness of the skin a necessity, and it is universally recognised that the beauty, health, and vigour of the horse are largely dependent upon the condition of his integument. The function of the skin is very important, and just in proportion as that function is maintained in activity, so will the health be improved. To clean the skin thoroughly, a brush is, perhaps, the best appliance; though in Eastern countries, where the horses have very thin, sensitive skins, and fine coats, as well as with some horses in our own country, a brush may cause considerable irritation. Grooming is not required to the same degree, perhaps, with all horses; the slow-paced cart or farm horses, or horses which are much exposed to the weather, or whose work is not fast, do not require, and, in fact, should not receive, so much grooming as carriage horses, hunters, or racehorses. Indeed, the former are none the worse for having a little grease in their skin, to

protect them from the cold and the wet; but dirt of every description should be removed from the surface, and all loose dandriff brushed from amongst the hair. With regard to the grooming of farm horses, Reynolds recommends that they should not be curry-combed, but brushed and well wisped over before being turned out to work, and again on completion of their day's labour. After being stabled wet, from rain or perspiration, the skin must be thoroughly dried, and at supper-time a brisk dry wisping instituted to determine increased surface-circulation, and promote a feeling of warmth and comfort for the night. For hardening the backs and shoulders of colts recently put to work, and of horses having irritable skins, a free application of salt and water to the saddle and collar-seats is beneficial.

Many persons advocate clipping the hair from the legs of heavy horses, a practice highly pernicious, and one to be condemned in the strongest terms. Hair is the natural protector of the cuticle, and is especially required to warm and shield the delicate skin of the heels; its removal from these situations is certain to induce a predisposition to "*grease*," and other equally serious consequences. If the legs are muddy on return from labour, they should be dried as far as practicable, and the adherent clay subsequently removed with a hard brush. The application of the thinnest possible film of pure neatsfoot oil to the surface of the hair of the legs will prevent the adhesion of clay, but it should only be used when absolutely necessary. Opinions vary upon the desirability of washing the legs of cart horses. As a rule, the practice is unnecessary and injudicious; but when the legs have become thoroughly saturated during labour, there can be no further harm occasioned by washing off any mud which may also have accumulated amongst the hair. It must, however, be regarded, as essential to proper management, that under no pretext is a horse to be left for the night until all his legs have been thoroughly

dried. Nor is this precept very difficult of execution; a handful or two of light wood sawdust rubbed for a few minutes well into the hair will absorb all moisture from the most hirsute legs, affording not only a sense of comfort to the animal, but preventing those undesirable consequences engendered by continued application of cold and wet to the extremities.

The iron curry-comb should never, as a rule, be applied to the skin of horses. For long rough coats, nothing is better than a good dandy-brush to remove dandriff, dust, and dirt; for finer-coated horses, a good bristle-brush suffices, and the use of this may be advantageously supplemented by the wisp and rubber; indeed, for some extremely thin-skinned, fine-coated horses, the two latter are generally found sufficient, provided the groom applies them energetically and efficiently.

In India, the syce or groom rarely resorts to anything else than the palms of his hands and the sides of his arms up to the elbows, in order to make the coat shine. Whatever may be used, it is necessary that the hair be worked in its natural direction, and the surface of the skin must be well acted upon. The times at which grooming should be performed must vary with convenience; the horse ought to be groomed, if possible, early in the morning, and either immediately after the stable has been cleaned out, or after that has been done and the horse exercised. Grooming is undoubtedly best performed immediately after exercise, as then the skin is in a much better condition for being cleaned; and the cleaning should extend from the face to the heels, and include thorough brushing of the forelock, mane, and tail, with sponging of the nostrils, lips, eyes, and beneath the tail, as well as washing the hoofs.

If the horse is heated, or is wet from perspiration or rain, he should on no account be allowed to remain undried for any length of time; but if he cannot be attended to immediately in a proper manner, he may either receive a temporary wisping of the body and legs, or clothing and bandaging these,

or leaving on the saddle or harness until an opportunity arrives for grooming him; or, better still, he may be exercised for a short time, so as to prevent what is called a chill. When he can be attended to, the legs should be first well dried, and then bandaged, a blanket being thrown over the body meanwhile; when all the legs have been so treated, the body may then be groomed, and when this has been finished, if necessary, the bandages may be removed from the legs, and these thoroughly brushed out. It is very dangerous to allow the skin to dry by simple evaporation, and especially in a cold or draughty stable; as pleurisy, bronchitis, and inflammation of the lungs or intestines are very often the result.

To groom a horse properly requires a considerable amount of time, and much skill and exertion; it is therefore necessary, unless grooms are very trustworthy, that owners of horses should know when their horses are groomed, and should also see that it is done thoroughly. A well-groomed horse gives evidence of the fact in the clean, shining, and healthy appearance of the coat, and if the hand be rubbed against the hairs it is not soiled by them. If, on the contrary, the horse is not well groomed, the coat will be dull, staring, and unsightly, and patches of dirt may be seen upon it, while if the hand is pushed up through it, it will be covered with a white greasy film, and if the animal has perspired, scurf and dirt will be observed where the saddle or harness have been; while an examination of the points of the hips and shoulders, the sides and points of the hocks, the roots of the hairs of the mane, tail, and forelock, will yield further evidence. When the legs must be washed, which sometimes happens, as when very muddy, or with white and grey-legged horses, they should be thoroughly dried immediately after, and wrapped in flannel bandages. Some grooms are greatly in favour of washing the body and legs, but unless in special cases—as when the skin is extremely greasy or dirty—this cannot be recommended. It is much

better to wisp or scrape well, or both, and then clothe and bandage, if the body is wet, leaving the thorough cleaning to be carried out when circumstances are favourable. More especially should this procedure be observed in winter, in order to avoid what is known as "mud fever." If perfect drying could be ensured immediately after washing, perhaps no harm would result; but as this cannot always be relied upon, washing had better be dispensed with.

Sometimes horses break out into a cold perspiration after they have been groomed, should they have undergone exertion a short time before. As this is not only uncomfortable, but renders the skin very cold, it is necessary to dry them repeatedly until the dampness is removed.

Cracked and greasy heels are usually caused by wet, either from wet muddy roads, or from washing the legs and leaving them wet, or imperfectly drying them. Unless they can be thoroughly dried, it is well to leave them alone, or to remove as much as possible of the superfluous moisture with a wisp of straw, and, when convenient, bandaging them. When they are dry they may be cleaned with a dandy-brush, or if the hair be very long and thick, a leg or birch broom answers very well. A predisposition to cracked heels is engendered by clipping the legs and pasterns in winter; this should never be done, if possible, but if it is necessary, then the skin should be protected from the action of wet and dirt by rubbing into it, before the horse leaves the stable, lard, vaseline, or zinc ointment. A very good protection against the action of icy cold water, or the salt slush which is so common on tramway lines in winter, is a mixture of one part whitelead and three parts common oil, rubbed around the pasterns and the coronets by means of a brush.

CLOTHING.

For horses with fine skins, which require to be kept scrupulously clean and glossy, as well as for those performing fast

work in cold weather, clothing is necessary. For the former it is required all the year round, but in warm weather it may be limited to a light sheet to keep off the dust; in cold weather, however, the clothing must be warm, to maintain the temperature of the surface of the body, and keep the horse in good condition. Keeping the body warm is a saving in food, strength, and vigour.

Horses doing slow work, and which have thick greasy coats, do not require to be clothed. The quantity of clothing to be worn will depend upon circumstances, the chief of which is the temperature of the stable; but it should never be so much as to induce perspiration. It must be remembered that it is far better to keep a horse warm by clothing than by keeping him in a hot stable. If a roller is worn, it should be well padded on the back, with a channel for the spine, as injury of this part is very common when this is not attended to. If the horse has high withers, the blanket should be well hollowed out in that part, with a view of preventing bruise or chafing; a strap and buckle should secure the two ends of the blanket over the chest. In some stables two suits of clothing are allowed—one for the day, another for the night; this permits of the clothing being well brushed and aired when not worn. If only one suit is used, it should be aired and cleaned when the horse is out at exercise or work.

CLIPPING AND SINGEING.

With well-bred, fine-skinned horses kept in comfortable stables, and having good grooming and clothing, the natural coat, except when they are aged, need not be interfered with; but there are horses which, in conditions opposite to those mentioned, carry longer coats in winter, and if made to do fast work, perspire so much that they do not dry again for a long time; and, besides, wearing a heavy coat appears to make them

sluggish and spiritless. With such animals great advantage is derived from the removing as much of the hair as possible by either singeing, clipping, or shaving them. The skin deprived of the excess of hair is much easier cleaned and dried, and secondary sweating is prevented; while the animal himself will do more work, and with much more sprightliness. Singeing should be resorted to whenever the coat begins to lengthen in the autumn, and should be repeated every week or ten days until the end of winter. Gas singeing is the best, when it can be made available; the operation should always be performed by a careful groom, as the skin is liable to be scorched or blistered by a careless or inexperienced person.

Clipping is resorted to for horses with heavier coats, and when these have set it is perhaps more advantageous than singeing, and it is certainly less troublesome; though it is not unusual to pass the singeing lamp over the skin of the clipped horse several times during the season. With some horses, and especially if they are advanced in years, little clothed, or kept in cold stables, if singeing is not resorted to, a second clipping will be necessary. With hunters, and particularly those exposed to "mud fever," or which have to pass through thorn bushes, it is usual to leave the legs, a short distance above the knees and hocks, untouched. It must be remembered that clipped horses feel the cold much more than those which are unclipped, and if kept standing for any time out of doors unclothed are certain to be seriously affected by it. It is therefore necessary to keep them moving as much as possible, or, at any rate, not to allow them to stand longer than can be helped.

For horses which are out the greater part of the day doing slow work, and especially if having to stand for considerable periods, if the back and loins are not protected by a waterproof in cold wet weather, as some horses are, the coat should be left undisturbed; indeed, the less grooming they receive the better,

as the grease and dandriff which accumulate in the long hair afford a natural protective covering.

It may be remarked that neither when the body is being clipped, nor at any other time, should the hairs be removed from inside the ears, as they prevent the entrance of insects, dust, and other troublesome bodies, which would otherwise gain access to these important and sensitive cavities; neither should the long bristly hairs about the eyes, nostrils, or lips be cut, as these perform a very important office in warning the horse against injury to those parts.

With regard to shaving, instead of clipping or singeing, this is seldom performed, as it is difficult, requires much time, and leaves the skin too denuded.

BANDAGING.

The legs of well-bred thin-skinned horses, or those which are sick or lame, are frequently bandaged, the bandages being either of flannel or linen. Flannel bandages keep the legs warm, and if these are wet assist in drying them, while by the equable pressure they produce, they assist the circulation, and so prevent stiffness and swelling. Linen bandages are employed to accelerate the circulation, and keep the legs fine, without making them too hot. Bandages are sometimes wetted with cold water or evaporating lotion, to reduce heat or inflammation. When a horse's legs are very cold, or there is a tendency to swelling after severe exertion, they ought to be well hand-rubbed before the bandages are applied. It is very important that the bandages should not be put on too tight, as then they are apt to retard, instead of assisting, the circulation. In applying them, it is best to begin at the lower end of the limb and work upwards.

LITTER.

Next to good grooming, perhaps, so far as the horse's health and comfort are concerned, is the allowing him plenty

of good clean litter. This is usually straw, and there is no doubt that for healthy horses it makes the best bed. Of all straw the best is that of wheat. A good bed implies a liberal allowance of straw, and there are many horses which will not lie down, or will rest badly when down, unless the bed is good. Unless horses rest well, and especially if they refuse to lie down, they cannot perform their work in a satisfactory manner; and therefore every inducement for them to take their natural rest should be provided, and a plentiful, clean, and well-arranged bed of sweet dry straw is certainly most conducive to that end. Wheat straw is stronger and tougher, and more easily spread, than other kinds, and is therefore best suited for bedding purposes. It should be unbroken, dry, clean, bright in colour, and not have broad flaggy leaves. Wheat straw being long, it happens that it frequently becomes soiled at one end only, and this often causes it to be thrown away as manure; to obviate this apparent extravagance, each bundle of straw may be cut in halves before being used. An allowance of from 8 lbs. to 12 lbs. of good wheat straw per day should furnish a fairly good bed. Other kinds of straw, as oat straw, do not answer so well, they being either too hard or too soft, and less durable, being easily converted into manure. Sometimes hay, too bad to be used as forage, is used as litter; but this is objectionable, as it cannot make a comfortable bed, and it is said that if its use be continued for any length of time the horses will become infected with lice.

Horses should stand upon a thin layer of litter, if the stable floor is dry, when they are not allowed to lie down; this litter should be that which has been used, but it must be dry. If horses work hard and require much rest, the resting bed should be laid down at the most convenient period. To prevent voracious horses eating the straw—which very often proves hurtful, as well as to save it—the fresh straw should not be placed within their reach. In order to accomplish this,

it is recommended that the old litter be put at the top and in front of the stall, and the new put at the rear of the stall, and covered with some old; the horse cannot then get to it, and it soon becomes tainted, and therefore not cared for. Sometimes, with the same object in view, the old and the new bedding are mixed up together before being laid down. Grooms are in the habit of laying down the old litter first and putting new straw on the top of it, for the reason that it keeps the clothing cleaner, and gives the stall a better appearance. Economy in straw depends much upon the attention given to the bedding in the morning, when the stable is being cleaned out. If possible, all the litter should be taken outside the stable, thoroughly shaken up and sorted, the wet and rotten, as well as the dung, being removed from it; it should then be allowed to dry by exposure to the air and sun, being turned over once or twice to ensure its thorough purification. While the litter is thus being rendered dry and sweet, the stable floor should be swept perfectly clean, and allowed to dry before being covered again by the litter. It is a great mistake to allow foul bedding to be heaped under the manger, as is usually done, because the ammonia from it is inhaled by the horse, and affects his eyes, while it taints his food and everything in the stable. If there is no litter-shed outside the stable, then in wet weather, when it cannot be exposed to the sun and air, it should be put in a spare stall, or spread out in the passage behind the horse.

Sawdust is frequently employed for bedding, especially in town stables, and opinions differ as to its value. Reynolds asserts that it is not liked by cart horses; at the best it is comfortless and uninviting, and should only be introduced into undrained stables provided with paved floors. The objections to sawdust do not apply where it is used as a cushion to be interposed between stone floors and the straw, where, in fact, it bears the same relation to straw as a mattress to a feather

bed; so arranged, Reynolds regards it as economical and a saving to straw, and as being also an absolute comfort and benefit to the horse.

For horses which eat their litter to such an extent as to prove injurious, sawdust is to be recommended as bedding, one horse requiring about a hundredweight per week. If drains are in the stable, it is liable to choke them.

Sea-sand can be used as bedding, and it answers very well.

Peat is sometimes used in districts where it can be easily obtained, and the light-coloured peat, found abundantly on the Continent, and in some parts of this country, and popularly known as moss litter, has come very much into use lately. Though various conflicting opinions have been given with regard to it, in stables where it has been extensively used, its adoption has been attended with advantage to the horses both in their limbs and feet, as well as their general health, while a great money saving has been effected. It is a powerful deodoriser and absorbent, makes a very soft elastic bed, and horses do not, as a rule, care to eat it. When of good quality and properly prepared, there can be no doubt that it is a valuable litter; though the depreciation in price, caused by excessive competition, has brought a very inferior supply into the market. For horses with tender or contracted feet, or whose hoofs are bad or grow slowly, it is very advantageous. It is also valuable as a manure, and by its use in stables drains can be dispensed with.

EXERCISE.

When not performing regular work, horses require steady exercise at regular periods during the intervals; if this be neglected, the horse becomes "soft," fat, and is predisposed to disease. In addition to exercise, as already mentioned, less food, especially grain, should be given, than during hard work. The best time for exercise will depend upon circumstances; the early morning is usually preferred by grooms, but to this there

are objections; in the first place, sufficient time is not allowed, especially if the groom is not an early riser; in the second place, cleaning out the stable is not thoroughly done before starting; in the third place, in winter the mornings are cold and dark; and in the fourth place, the horse may not have had time to consume his morning feed before he is taken out.

For these reasons, it is preferable to have the horse exercised after breakfast.

The amount of exercise must depend upon the condition of the horse, upon the kind of work he has to perform, and other circumstances. Walking is, perhaps, better than any other exercise for the majority of horses, and two hours a day should be the *minimum* allowed. If the weather is cold, or if the horses are in gross condition, clothing should be worn.

WORK.

No definite rules can be laid down for the amount of work horses should be called upon to perform, so much will depend upon the character of the work, their age, quality, condition, season, the nature of the country, food, and general management. Nothing requires more careful watching. If unaccustomed to the work, or not in condition, then the horses should be gradually inured to it, to prevent injurious fatigue or breaking down. Work is sometimes estimated by the number of hours employed, by the distance travelled, by the weight carried or drawn, and by the resistance overcome; but the circumstances which lead to variations in the results of horse labour are so numerous that it is impossible to deal with them separately, and they must be met by the experience of the owner as they arise. The old aphorism, that "it's the pace that kills," is applicable to the hunter and racehorse as well as to the draught horse; and it must be remembered that in proportion as the pace is increased, so must the duration of labour, as well as the weight to be moved, be diminished.

Horse-power is most advantageously employed when the pace is slow, and the hours of labour prolonged in proportion. It has been remarked that draught horses can work long hours, and draw very heavy loads, if they are not over-paced; but to demand from them quick movement, in order that a day's work may be completed at an early hour, will, if continued from day to day, materially shorten their periods of useful existence. In illustration of this, the following examples are given. It is required, as the daily work of two pairs of horses, equal in every particular, to transport twenty-four tons of merchandise a distance of two miles from a given place; one pair is occupied only six hours in drawing three four-ton loads, and returning with the empty dray; the other pair, similarly loaded, is two or three hours longer doing the same distance. The effect of the two arrangements will become perceptible in a few months; for although the first pair will rest in the stable at least two hours of the twenty-four more than the second pair, the latter will exhibit less fatigue, maintain better condition, and wear the longest. If the natural pace of a draught horse is three miles an hour, he may, if not overloaded, travel fourteen or sixteen miles in five to six hours; but to compel a horse whose natural pace is only two, or two and a half miles an hour, to accomplish that distance in the same time, will certainly injure him; while if the same horse work for ten hours on the same distance he will probably last as long as, if not longer than, the faster-paced horse, and probably keep in as good condition, even on a smaller allowance of food. When two horses work together, the pace of the slowest should be taken as the standard of speed; though it is always better to have them as closely matched in this respect as possible. It is the same when a large number of horses are travelling together; the rate of travel should be governed by the pace of the slowest horses. Overwork is, like underfeeding, false economy, and, if continued, shortens the horse's

useful life ; and it must be remembered that more injury can be inflicted by a few days', or, indeed, for that matter, a few hours', overwork than it will take weeks, or perhaps months, to repair. If the labour is severe or long, it is well, if possible, to allow an interval of rest during its performance, if only for a short period, and, if necessary, a mouthful of food and water. For horses working slowly for several hours, a rest of twenty or thirty minutes at the end of four hours greatly benefits them, as during the interval they have time for a meal. A longer fast than four hours is also not advisable, for reasons before given.

In tramcar work, which is, on the whole, pretty heavy, a maximum of fourteen miles a day is considered a fair amount of work per horse, for seven days in the week. If a horse is severely pushed one day, he must have a corresponding amount of rest to recuperate on following days ; for instance, two days' hunting in the week is estimated as sufficient for a horse in good condition, the other days being devoted to rest and exercise. Of course, in addition to the influences which we have already mentioned as operating in this matter, the manner in which the horse is made to do his work by the rider or driver counts for much : a skilful, considerate, and humane man getting much more work out of a horse, with less fatigue or injury to the animal, than one who is inexperienced, stupid, or brutal. A good horseman should know when his horse is over-exerted, or discouraged, and relieve him accordingly ; and the animal's efforts should be stimulated by a kindly word, or encouraging pat, just as his fear or over-excitement ought to be allayed in the same way. The watchful eye and the sympathetic heart of the real horseman are everything to the horse.

REST.

Rest, to a hard-worked horse, is as much a necessity as good food, and the animal should enjoy as complete repose as possible

during the time allowed for it; quiet and freedom from disturbance are, therefore, essential to refreshing rest. Where horses are resting, persons or other horses should not be allowed to enter the stable, if possible, and all unnecessary noise should be prevented. If the stable is large, and contains a number of horses, working at different hours, the arrangements made for relief should, as far as practicable, be such as will obviate disturbance to those which are resting. Horses always rest better in a loose box, as they are then at liberty to choose the position in which they feel most comfortable; in fact, all horses should, if possible, be kept in loose boxes, but it unfortunately happens that such an arrangement can rarely be carried out—space, expense, and other reasons interfere. Stalls should be roomy and well constructed, so as to allow of the horse lying at full length, and with his legs stretched out, with no tendency to slide down towards the heel-drain. Some horses, if ever so tired, will not lie down until the stable is quiet, and even dark; and some, again, take far too little rest, and remain the greater part of their time standing, even when provided with the most seductive bed. Unless a horse lies down regularly to rest his limbs, these swell, and the joints stiffen, so that he comes out of his stable, after the period allotted to rest, stilty and stumbling; and though such horses may continue to work for some time, without ever lying down, nevertheless they would last longer, and perform their work better, if they rested a sufficient time. It has been observed that nervous horses often refuse to lie down when first made to occupy a stall, or when introduced into a strange stable, especially if among strange horses; this disinclination to rest naturally may become a confirmed habit, and the horse consequently suffer. Every inducement should therefore be offered to obviate the evil, and the animal should either be put into a roomy, quiet stall by himself, or, better still, into a comfortable loose box, until he has become accustomed to the change of scene, companions,

and work. Horses that have suffered from injury to the spine, or whose hocks are diseased, will not lie down, or if they do, they cannot get up again without assistance. It is generally necessary with such to place them in slings when they come in from work, in order that they may rest in them, in a standing attitude, instead of lying down.

Of course, after a hard day's work, the first thing to be done is to attend to the horse's comfort. If he is very exhausted from fatigue, or long fasting, a bucketful of warm (if the weather is cold) oatmeal gruel should be given him as soon as possible, before anything else is done to him; during the process of cleaning, hay may be allowed, and when he has been thoroughly cleaned, clothed, bandaged, and bedded down, he may have his grain feed—mixed, if necessary, with a pound of linseed boiled to a jelly, the hay rack being filled with hay. Then he ought to be allowed to rest until next morning, when he should be well groomed and exercised if standing in a stall, or allowed to rest for the day if in a loose box.

Nothing conduces more to rest and cheerfulness than having horses which agree with each other placed in adjoining stalls; quarrelling, biting, and kicking are the results of incompatibility of temper among horses, and as a rule may be prevented by mating those which like each other. A troublesome horse should be put in an end stall, and if he is inclined to bite his neighbour, a spare stall may be allowed to intervene, or the collar-rein may pass through a ring at the far side of the manger, instead of the middle.

STABLE ROUTINE.

For the good management of all stables, a certain routine and discipline are necessary, and these must be rigorously carried out; without them, the stable will neither be clean, healthy, nor comfortable, and the horses will be in an unsatisfactory condition. If the proprietor cannot himself superintend the management of his stables, that duty should be confided to a

trustworthy and experienced man, who will not only make the other men perform their work in a proper and regular manner, but will be capable of estimating the fitness of the horses for their individual labour, understand their disposition and peculiarities, their different appetites, and everything pertaining to feeding and grooming, exercise, ventilation, etc., as well as ensuring safety, and prevention of waste.

The system of routine of stables must be governed by circumstances, but regularity and punctuality in whatever has to be done should be rigidly enforced. Neatness and cleanliness are sure indications of good management.

The morning stable hour will depend upon the season of the year, the nature of the work, and other matters. If the stable be close, the first thing to be done is to allow the escape of hot foul air, and the admission of fresh air; then a glance round the horses to see they are all right. Having been watered and fed, the stalls in the stable are cleaned out, the litter being attended to as before directed; the feed having been consumed, the horses are taken out for exercise, or if they must go to work, they are cleaned and harnessed. After exercise or work, when the horses return to stable, grooming is again performed, and the horses are bedded down. Before leaving horses for the night, if they are in stalls, the head-stalls should be carefully examined to see they fit the head properly and are secure; also that the head collar rope or chain is not too long, but just sufficient to allow the head to rest on the ground when the horse is lying down. If corn bins are kept in the stable they should be carefully fastened, so that should a horse chance to get loose he may not be able to have access to the oats. Forks and other sharp instruments should not be kept within the stables; indeed, instead of sharp-pointed forks for the litter, it is much safer to have those with quite blunt points.

CHAPTER V.

RIDING AND HUNTING.

The remarks on this subject are especially addressed to those who are beginning to ride and hunt. They are written, as is the following chapter, with a primary view to the horse, not with any idea of teaching the arts of equitation.

It is assumed that the rider commences with his horse properly bitted and saddled: which means that he has a bridle and saddle to suit; that the former is the proper length in the head-piece, and that the curb (if one is used) and throat lash are moderately loose, the former to suit the horse's mouth, the latter to be so loose as to allow the horse's head to be well bent in, with little or no pressure on the throat.

There are various kinds of bridles used for riding and hunting, and most hunting men have different ideas as to the kind of bit they think horses go best in. The following are the bits chiefly used for hunters. The ordinary bit and bridoon, double bridle, plain or twisted snaffle, gag snaffle, chain snaffle, Newmarket snaffle, ring snaffle, secundo, etc., etc. In Ireland two ordinary bits on one head-piece for pulling horses are greatly used, and they have been highly spoken of as being effectual in stopping "pullers" to a great extent.

A bit much employed in Kildare, and which is highly approved, is the thick, smooth, ring snaffle, with a single rein, and used with or without a martingale, as the horse may require.

A "secundo" is a severe bit, and is used chiefly for

horses that pull very hard, and which are apt at times to take charge of their rider; as well as for horses that are given to running out at their fences. A friend used one in India for some considerable time on a favourite horse used for steeple-chasing; he was very ready to run out; but with this bit the rider was always able to keep him straight at his fences, and after a time he got out of the habit of running out, and the use of so severe a bit was discontinued.

A bit much favoured in Ireland is a chain snaffle, of which a very high opinion has been expressed for hunters, either for those which are given to running up to their bits or light-mouthed horses. That is, provided it is used by men who have got some idea of hands. As the chain snaffle can be made either the lightest or the most severe bit of the snaffle kind, it certainly is the lightest for a horse to carry, and were it more used it would become the most popular bit for hunters in Ireland.

The universal opinion about bits in Ireland is that if a horse can be got to go at all in a snaffle of any kind, it is injudicious to use a bit requiring a curb—the supposed reason being that any bit with a curb deprives a horse of that freedom about the head requisite for jumping banks, etc., safely. There is another kind of chain bit, made of large links with a flat, broad, solid link in the centre, which makes a severe bit for hard pullers, and which is very effective for horses with hard mouths. But if a horse is given to turning off at his fences, nothing is so effectual in keeping him straight as a bit and bridoon, or, better still, a "secundo."

A very essential requisite in every man, in order to become a good horseman and rider, is the quality known as "good hands;" without this, most bits on awkward horses are ineffective. Good hands with almost any kind of bit, providing the horse gets a good amount of work, will generally have the effect of making him go quietly in time; of course, there are

horses that are incorrigible as hacks and hunters, in spite of all the skill and efforts that it is possible to apply in the way of bits and hands, and it is useless to keep horses of this kind. A friend had a horse at the beginning of last season that he was obliged to get rid of for vice; the animal bored and pulled so hard as soon as hounds began to run, and galloped so blindly, that he gave his rider three falls in one day in a run of not more than ten minutes' duration; this was the first day on him. The next day he was ridden in a chain snaffle, with which his pace could be regulated to any extent; but when he found this out he suddenly stopped and would do nothing but rear; he was never hunted again, but sent to a dealer to be sold.

The saddle should, as a rule, be about four or five inches behind the highest point of the horse's withers; the girths fairly tight. And when the rider is in the saddle, he should have room enough to put at least two fingers between the gullet arch of the saddle and the top of the withers; otherwise there is a danger of the saddle coming down on the withers and giving the horse a sore back. The stirrup leathers should be simply buckled, and left out of the keeper part of the buckle, so as to be convenient for altering the length of the stirrup if required; while the spring latches of the stirrup bars should be left down, so that in the event of an accident the leather is almost sure to slip off the bar, and thus prevent the rider from being dragged more than a very short distance.

Breast plates (shoulder straps) are required for some horses, especially towards the end of the hunting season, when they get light in condition, and the girths, as well as the saddle, slip back; it is therefore most important that this article of equipment should always be at hand. The experience of many hunting men goes to show that not unfrequently they have lost a good day's sport through neglecting to have one put on. It is surprising what a hard and long day's hunting will

do sometimes, in the way of making a horse so tucked up that, although he may never previously have required such a thing as shoulder straps, he will most likely have to wear them till the end of the season, if kept in regular work. Other horses with light back ribs will require this article of saddlery throughout the season.

During a recent hunting season a horse was sold on account of his having such a light waist that, even with shoulder straps, there was great difficulty in keeping the saddle forward; the horse was afterwards seen running in a steeplechase with a lead cloth under the saddle and no breast plate on; needless to say the saddle began to slip back as soon as the horse commenced to gallop, and long before half the distance had been traversed the saddle was on the horse's loins, the lead cloth half-way down one side, and altogether the position of the rider was a most unenviable one. But for this oversight in saddling, probably the horse would have won the race.

Martingales are not generally required for hunters, but when they are they should always be of a good length, so as not to interfere with the horse's head when jumping.

Rings on the reins are sometimes used, instead of a martingale, and they answer tolerably well for some horses.

Saddle-cloths of different materials are, according to circumstances, occasionally used. Those of felt are most useful when the saddle stuffing has become thin, or when the horse's back has become sore. Leather saddle-cloths chiefly preserve the lining of the saddle; but, as a rule, a saddle looks better, is lighter, and less liable to give a horse a sore back, when well stuffed, than when a saddle-cloth is used.

It is a very good plan, and is also a custom with some men, to have the coat left unclipped on the horse's back under the saddle.

Whilst speaking of the horse's coat, it may be mentioned that leaving the legs unclipped is a most admirable and humane

practice, as it preserves them from scratches of thorns, and from mud, wet, cold, etc., and hunters fare very badly if they are deprived of this protection.

Holding the reins is a matter of little consequence. The ordinary way of placing one rein outside the little finger of the left hand, with the remaining three between each of the other fingers, that is, when a double bridle is used, is the most convenient method while walking and trotting; but when the pace is increased to a canter or gallop, both hands must be used, and the right rein must, after leaving the right hand, pass across to the left hand and *vice versâ*, which arrangement connects the two hands firmly, but not too tightly together, and consequently affords the rider much more power in his arms than he otherwise would have without such connection.

When a horse is jumping, both hands should be kept on the reins, instead of leaving go with one hand, as so many men do, throwing the unemployed hand in the air, as though putting up a signal to those behind that there is a drop, or formidable ditch on the landing side of the fence, besides making their seat less secure, and being less prepared to assist the horse in case he should make a mistake. This habit of leaving hold of the reins with one hand in jumping cannot be too strongly condemned; as there is another habit which it leads to, that is, clutching hold of the saddle behind, which is the worst habit any young rider can acquire. Men have been seen nervously clutching the back part of the saddle at every small ditch or obstacle they went over, not because they were afraid of falling off, but merely from force of habit.

The Hunting Crop is generally held in the right hand, about six inches from the loop, with the hook downwards, the lash coiled up and held in the same hand. This is, of course, when the crop is not in use. A good saddle and bridle by a good maker have a great significance for hunting men, and, for perfect articles, one need go no further than in

recommending the saddles and bridles of well-known London establishments, which are of the best quality and shape in every way. The fashion is to have plain flaps, which look very much neater, and wear longer, than flaps with rolls, on account of the leather being thicker; but it is doubtful if they are quite so comfortable, therefore it is a matter of choice between appearance and comfort. Rolls are a great help in steeple-chasing, so also is the doeskin saddle.

There are various kinds of safety bars used for stirrups, but many men do not believe in them, as riders have been seen hung up in them frequently, and more especially on the opposite side to that on which they have fallen, the bars not having given way as they were expected to do. Their superiority over the ordinary bar, with the spring latch let down, is very questionable; and it may be asserted that if a man has a stirrup iron large enough for his foot, he will rarely get hung up in the stirrup. It should be large enough for the foot to turn round in, in every direction, without getting stuck fast when pushed home to the ankle. With this precaution there is scarcely a possibility of the foot ever sticking in the stirrup, no matter how the rider may be thrown. Leman's patent safety stirrup is greatly used in Ireland, and highly spoken of by those who use it.

Having mounted, the rider arranges his position in the saddle, which should be with the feet well home in the stirrup-irons (unless the riding is to be on a hack along a road, when the stirrup may be kept under the ball of the big toe), toes turned slightly outwards, stirrups of medium length, neither too long nor too short, as either extreme is very uncomfortable for both horse and rider, as well as looking very unworkmanlike: the weight in the former case being thrown too far forward, in the latter too far back on the horse's loins.

The body should be fairly erect, but without any approach to a military seat, which looks very awkward, and is

unbecoming to any man not riding in a military saddle, not to speak of the discomfort it must occasion the horse when a man sits in such an uncomfortable and constrained position.

It is unnecessary to attempt to describe the means by which a man must give himself a firm seat, while the horse is plunging and jumping, as such knowledge can only be acquired by constant practice and experience, which will teach the rider that a firm grip with the knees is the best means of sticking on, and leaning backwards or forwards as circumstances may require. The management of the reins under similar circumstances depends on a man's hands for doing the right thing at the right moment, and practice alone can give hands and teach the rider how to manage a restive horse.

The elbows should be kept almost close to the sides, and the hands under ordinary circumstances should be from six to eight inches from the body, but they should never be stiff or held in any fixed position, but yielding, and ready to give and take to every movement of the horse's head.

In trotting off to cover there is nothing out of the usual to observe, but in the run more attention is demanded. We will, however, at this period confine ourselves strictly to the riding part of the performance.

No fixed rule can be laid down as to the style of seat a man riding across country should adopt, as so many men who probably go equally well ride differently; but it is essential that a few rules should always be observed, and amongst these are—

1st. A good firm seat, maintained by sitting well down in the saddle, with the knees in such a position that they are ever ready for instantaneous grip, whenever occasion requires. Most men incline well forward, standing in the stirrups with their knees pressed tight to the saddle when the horse is galloping, giving and taking at the horse's mouth according to the kind of mouth their steed possesses. Without the ability to

do this, no man can have what is termed good hands. When the horse is going at a good half or three-quarter speed, and nearing a fence, the rider should change the position of his body from that of forward, to that of leaning slightly backward, quickly but quietly, keeping a firm and steady hold of the horse's head, and steadying him when he is about twenty yards from the fence, again allowing the horse to put on more pace as he approaches the jump, and always be on the look out for a refusal or a blunder in jumping, and a "peck" on the landing side.

If the horse stumbles on to his knees and nose, and blunders on for a stride or two, the utmost endeavour should be made on the part of the rider to retain his seat, and this may be done by inclining backwards and keeping the strongest possible grip on the saddle from the thigh downwards, and a quick and forcible pull at the horse's mouth, to help him, if possible, in raising his head from the ground.

Many people will, perhaps, disagree with this advice as to trying to raise the horse's head; but hard-riding horsemen firmly believe that they have averted many a fall by timely and judicious assistance with the reins, which, though hard to explain, is held by them to be a practical fact, and is, therefore, pressed for adoption.

When a horse falls in jumping, it is, as a rule, better policy to try to retain the reins. If it is a very "ugly" fall, and the horse rolls on to his rider, all that can be attempted is to try and get out of the horse's way as quickly as possible, which cannot always be accomplished; but no part of a moment should be lost in endeavouring to get hold of the reins the instant the rider's feet are on the ground.

The kind of obstacle the rider is about to meet will be his chief guide as to the pace to maintain as he approaches it. If it is a sound bank (an on and off), a good half-speed gallop; if it is a wall, a good "steadier" is, as a rule, required; but if it

is an open ditch, or water, the pace must be increased considerably. In hunting, most people take a pull at their horse when he is about twenty or thirty yards from the fence; and the pace is again increased as the horse nears the fence; this slackening the pace gives both horse and rider time to see something of the kind of fence they are about to attempt to get over, and to clear it. If it is an impossible fence, or if the rider discovers wire in it, he has a chance of steering away from it. Different horses require to be ridden differently at their fences; for instance, a free jumping horse requires nice handling, and riding at an easy pace, probably; while a sluggish horse will require a reminder or two with the whip and spur; but a horse that runs out and refuses, needs to be ridden very determinately, yet not too fast nor too roughly, as either method would give him greater opportunities of running out or doing what he wished to do. If the horse is lazy, and dislikes jumping, he will slacken the pace of his own sweet will, and try to refuse; while other horses will, on nearing a fence, commence to rush as though they were ever so eager to jump, and either refuse or run out at the last moment, running out generally to the left. This can sometimes be avoided by the timely appliance of a cutting whip on the left side, or by showing the horse the whip on the near side of his head, at the same time bringing in the aid of Mr. Latchford (the spur-maker) on the side you expect your horse to turn. It is said that horses can jump walls and timber highest and safest when they are just well into a canter, say when they have had a trot of twenty yards, and have got into their second or third stride of a canter.

Horses when tired or blown require easing and nursing while galloping, and more steadying when they are put at a jump, as well as a little more of the rider's energy to let them know he is in earnest, and means to get over the obstacle. This is what is commonly called "pulling a horse together."

It is always wise to steady a hunter, if he is not very fit, over the first few fields, no matter at what pace the hounds are going; as to over-exert a horse at this period of the hunt often unduly fatigues him, and impairs his energy for the remainder of the day.

An instance of injudicious riding may be given. One day very recently while in a fast drag hunt, a man rode his not too fit horse to a standstill, and just as the hounds had checked he put his beaten horse at a rotten bank, which he was unable to get over, and so fell into the ditch on the other side. A judicious momentary walk, considering the hounds were not running, would have prevented the catastrophe, which spoilt the unfortunate man's sport for the rest of the day, as the horse had to be pulled out of the ditch, a very dirty one, and some considerable time elapsed before the saddle was clean enough to get into again. Needless to say, the gentleman was young in experience.

Another kind of rider, the opposite to the one just mentioned, is the man who mounts himself on the best horse he can obtain, and never ceases to assure his friends that he has got the best horse in the world, and (if you had not been present yourself) that he had been going like the wind in front of everybody; whereas, as a matter of fact, he never rides a yard, and is always ready to say, as an excuse for being out of a fast run, that he has been helping a lady out of a ditch.

Riding to hounds.—On starting for a day's hunting, it is better to ride at a walk for at least the first mile, after which you may increase your pace to a covert "jog trot," which should not exceed between five or six miles an hour, and, if possible, on the side of the road; this should be frequently alternated with walking.

On reaching the meet, if you are riding your hunter, and especially if you have come a considerable distance, endeavour, if possible, when you arrive there, to put him up in a stable,

box, or shed, littered down. If you can only do this for three or four minutes, it is often sufficient, and the dismounting will often refresh your horse greatly. It is a good plan to examine your girths and tighten them up, if they require it, before trotting off to covert, and it is well to do the same after a long run; or if the horse is much blown they should be lengthened a hole, and tightened up again after the animal has got his wind.

When trotting off to covert, never ride too near the hounds, nor get into the way of them, more especially if you are on a horse that is not accustomed to being with hounds, as he is apt to kick them; and always have a pleasant word for the huntsman and whips. They are very civil men, as a rule, and appreciate a friendly remark or two, more especially if these are in praise of the hounds, or their own mounts; for to be huntsman or whip means for them having days of real hard work, as well as days of enjoyment.

On reaching the covert side, always keep with the rest of the field while the hounds are drawing. If you ride off alone, as so many do, you are sure to be riding where the places are left clear for the fox to break covert, and the less noise you make the better.

Always be ready for a good start when the "gone away" has sounded; but be sure to let the hounds get well on the line before you begin to race for a good place.

Never ride too near the hounds, nor on to them in their wake, but keep clear of them and well to one side. Masters of harriers know from bitter experience what a nuisance eager riding men are, and they have generally experienced the greatest difficulty on bad scenting days, in keeping even the worst men to hounds from riding over them. With fox hounds it is less important, as a fox generally goes straight, whereas hares twist and turn about in all directions; but it is just as essential that a hunting man should keep well out of the way

of fox-hounds as he should of harriers. He is sure to incur the anger of the master and the huntsman, and probably the majority of the field, if he rides over the hounds at every little check.

It is not good policy for a beginner to take a line of his own; but as he gains confidence in his knowledge of the sport, and in his own judgment as to the character of the country and capabilities of his horse to carry him, it is perhaps better to do so.

We will now presume that the young sportsman is fairly settled in the run. Now one of the most important things to bear in mind is to economise the horse's strength by easing him over heavy ground as much as possible. This he can generally do without giving up his place for more than a moment; for he who allows his horse to go at top speed over heavy plough, deep grass, or up a steep hill, will most surely pay the penalty before he gets to the end of it: that is, if there is any bad ground worth speaking of, for his horse must take more out of himself by far than if he had been saved till the sound going is reached again.

In some countries a great deal depends on a man's judgment and management to get through a day's hunting well. Where, for instance, the most part of the ground is ploughed land, the headlands or furrows are the places to choose, and even then the pace should be slackened somewhat, as nothing is so likely to bring a horse to harm as permitting him to become blown; which condition is very easily reached, if the rider is not careful, in a heavy country, and unless the precautions alluded to are taken. If a horse falls when blown or tired, he does so awkwardly and heavily. In some parts of Ireland (Kildare, for instance) the ditches are very wide and deep, and when a horse gets into them, especially if tired, he requires a great deal of pulling out.

Elsewhere an opinion has been given about the pace that

should be adopted in riding at the different kinds of obstacles met with in the hunting field; but, here again, so much depends on the pace hounds are going at, and the position the rider holds in the field, that no fixed rule can be laid down; so that the pace the hounds are keeping must be the guide. Never jump unnecessary fences; for instance, if a gate is on your line, and you can open it easily, do so, unless you are on a good timber jumper and the pace is very hot, or unless the fence looks very tempting on one or both sides of the gate.

When hounds are running it is "every man for himself," and every true and good sportsman tries to be well up with hounds; for unless he is he loses the chief pleasure of fox-hunting, which is to see the hounds work; and if in the event of a kill the rider has been well up throughout the run, and is in at the death, he is rewarded by the greatest pleasure a fox-hunter can have.

A few words of advice about things that ought to be observed after the hunting is over, and the rider has started on his way home, may not be inadmissible.

For the first few miles the horse should be allowed to walk, and, if the rider is accompanied by a friend, the pace should be accommodated to his, that is, if he is a sensible hunting man; as nothing is so annoying as to have a companion who goes off at a sharp trot, and nothing does a horse so much harm as unsteady riding on the road. If, after a hard day's hunting, the rider has to push his horse a long distance home, it is advisable to call at a wayside inn—that is, if one is on the way—and get him a little gruel (all the better if there is a quart of old ale in it), the horse to be put in a bedded-down stall, or box, if possible, while waiting for the gruel. The pace home should, under ordinary circumstances, be about the same as going to the hunt, unless the horse is very tired, when it ought to be slower, and the rider should get off and walk now and then, in order to ease his horse's back. Some

horses, when very tired, are liable to stumble; this, of course, the rider must be on the look-out for.

On arrival at home, it is every sportsman's duty to see his horse "done up," and made comfortable for the night, unless he has a very trustworthy stud-groom; and a careful examination for thorns in the horse's legs should always be made. The back should also be carefully inspected, in order to ascertain that the saddle has not galled it. This, with a good dressing over, a good bed, and other cares already noticed in stable management, will complete the horse's toilet for the night.

It is scarcely necessary for gentlemen, at least, to be reminded that the hunting horse should be treated with kindness and consideration at all times, and especially when in the field. Thoughtfulness in this respect is amply rewarded by the better wear and greater usefulness of the animal, and the kindly sympathy engendered between him and his rider, which is in itself a source of pleasure and gratification to the true lover of the noble beast. To spur and to punish, by bit and by hunting crop, a willing horse, or one which perhaps does not quite comprehend what is required of him, is not horsemanship, neither is it creditable; while to push a horse on until he is exhausted and reels and staggers, perhaps falls and dies, is unfeeling and brutal, and deserves the severest condemnation. Men who can be guilty of such cruelty have no business on horseback—in the pursuit of our own pleasure we have no right to inflict such pain. The real sportsman is he who knows how to get the most out of his horse, without distressing or breaking him down. When it unfortunately happens that a horse shows signs of distress—heavy in hand, floundering and swaying action, laboured breathing, etc.—he should be pulled up at once, the girths and throat strap loosened, the bit dropped out of the mouth, the saddle eased off the back, and the face turned towards the wind. If there is any water near, a mouthful or two may be allowed, or a

handkerchief dipped in it may be made to swab out the mouth and moisten the face and nostrils, while if the rider has any brandy in his flask, a little may be poured into the mouth now and again. The best remedy when a horse falls exhausted from congested lungs, and death is imminent, is copious bleeding from the jugular vein; but few amateurs could perform such an operation with safety.

CHAPTER VI.

HARNESS AND DRIVING.

HARNESS.

PROPER harness and harnessing are of the first importance in driving horses, and no one should attempt to handle the reins, and especially those attached to spirited horses, without more or less intimate knowledge of the different parts of harness equipment, how these should be put on and fit, and even what should be done in repairing or replacing them in cases of emergency, when they are broken, and when other parts cannot be substituted. The necessity for this knowledge is sometimes made most unpleasantly evident, as when a careless groom or hostler prepares the way for an accident by improperly harnessing or putting-to a nervous or high-mettled horse, and the driver is not cognisant of the risk he incurs.

It is needless to state that for safety and efficiency, as well as durability, harness should be of good material and well made; while for comfort and convenience it should be as simple and light as may be compatible with strength and other requirements.

The chief parts of harness for single draught, whether light or heavy, fast or slow, are: for the body, collar and traces; pad or saddle, with tugs, to support the shafts; crupper to keep the pad in its place; breeching to assist in backing the carriage or prevent its running on to the horse in descending a hill; and if the horse be inclined to kick, a kicking strap.

In double harness the breeching is often dispensed with. For the head there is the bridle, which is composed of the head-stall and bit or bits, to which are attached the reins, sometimes the bearing-rein, and the curb-chain.

The collar is a very important part of the harness, and is that which is usually put on first in the operation of harnessing. It consists of two portions, leather and metal; the first is the collar proper, composed mainly of leather stuffed with hair, straw, or some other appropriate material, and fitting around the neck, close to the shoulders; the other is the hames of metal, one lying on each side of the collar, both being joined by links at the bottom, with rings or terrets towards their upper part for the reins to pass through, and towards the middle an eye, or some other contrivance, for the attachment of the trace.

On the fitting of the collar and point of attachment of the traces the comfort of the horse and his efficiency in draught greatly depend; these points, therefore, should receive close attention. A collar too small presses upon the windpipe and causes distress to the horse, especially if the draught be heavy, and particularly if it be up-hill draught; while a collar too large interferes with the movement of the shoulders, has not a proper bearing, and has, consequently, a great tendency to bruise or chafe the shoulders. Speaking of heavy draught-horse collars, Reynolds remarks: "The collar, intended as it is to supply a cushion for the reception of shocks, and afford relief to pressure under heavy and continual draught, cannot well be too bulky nor too accurately adjusted. Great suffering is entailed, and horses are prone to become vicious and shy workers by being worked in collars too small, or unadapted to special conformation of shoulder, or rendered uncomfortable and irritating by wear or the accumulation of filth. Under severe up-hill draught, the collar will sometimes choke the horse by pressure upon the lower part of the windpipe. This

accident usually happens to horses that have long sloping shoulders and fine withers; it may be prevented, or at least the liability may be diminished, by having the collar "piped" —that is, hollowed out at its lower end where it may come into opposition with the windpipe, as that tube enters the chest. It is prudent to work horses prone to choke by the collar in chains rather than shaft-gears."

The collar should so fit that, when the horse is pulling, the weight of the load should be distributed over the front of the shoulders, at their junction with the neck, leaving the windpipe entirely free, instead of bearing only on certain points, or playing injuriously up and down. The collar should be made to fit the neck and shoulders, for as these differ more or less in nearly every horse, so there can be no universally-fitting collar. And when fitting it, the horse should be put into draught at a good pace, as the shape of the neck and shoulders is then different to what it is when the horse is not in motion—so much so, indeed, that a collar which appears to fit well when the animal is standing still will often be found much too short when drawing at a trot.

The lining of the collar should be of some soft, smooth, non-absorbent substance; possibly the best is leather. This should be kept clean and free from dirt and the products of perspiration.

The collar is usually pushed over the head, the wider part uppermost, and turned on the narrowest portion of the neck. This manœuvre many horses have a decided objection to, and especially when they have been frightened by it in their youth, or the coachman or groom are rough and violent. With such horses, a collar opening at the top is the best, and indeed for all horses it is the most easily put on, as the head is then not at all interfered with.

The point of attachment of the traces to the hames is also of some moment, as if too high or too low the horse draws at a

disadvantage. Collar-makers who understand their business, understand the conformation of horses' necks and shoulders, and know where to attach the traces to the hames. Where they do not, even when the collar fits, if the traces are attached too low they will draw the collar away from the upper part of the shoulders. When this is found to be the case, the obvious remedy is to shift the point of 'draft' until an even bearing is obtained. Ignorant people adopt two remedies, one of which partly conceals, while the other aggravates instead of curing the error. The first is to curve the upper part of the collar backwards; this, if not carried to excess is harmless. The other is to lead a strap back from near the top of the collar to the trace buckle, which practically converts the front end of the trace into a fork whose points are attached to the hames, opposite to the two movable ends of the shoulder-blades; so that, in fact, the play of this bone is effectually checked at both ends alternately. The trace should be attached as nearly as possible opposite to the immovable part of the shoulder-blade: that is, to the centre of the bone, which is *about an inch higher* than the hame-rings or hooks of the majority of wholesale-made collars.

The traces are attached to the hames in the manner already indicated, or by other means. Perhaps the best, because the most convenient, is the French plan, in which a piece like a hammer-head is fixed to each hame, and at the end of the trace is a slot or loop which passes sideways over the projection, so that when pulled straight it is firmly retained. This contrivance allows the trace to play easily, and the traces can be readily disengaged from the hames, so that a horse can be released from the traces by one person without leaving the animal's head.

Chafed shoulders should be carefully guarded against in all horses, but in young ones more particularly, as it may make them jib, or so badly scar the skin as to render it liable to

become raw very quickly. The horse must either be rested and astringent lotions applied, or the collar must be eased at the chafed part, if this is limited, or the animal may be worked in a breast-strap or collar. The latter is sometimes used continuously, but the only advantage it possesses is that it fits every horse; otherwise it is not so good as the collar.

When the shoulder is chafed in a particular part on a journey, and there is no opportunity for having the collar altered, an opening may be made in the lining and some of the stuffing removed over the part. Or if it is unadvisable to damage the collar in this way, a piece of cloth folded to make a pad may be tied on the collar immediately above the injured place, so as to relieve it from pressure; this, however, is a very temporary expedient.

The traces should be of equal length, otherwise traction will be more on one shoulder than the other, to the injury of that which sustains most pressure. Traces for gentlemen's carriage horses usually have a large buckle not far from the collar, with the view of shortening them; but this is rarely necessary, unless the same traces are used with various-sized horses, and they might be dispensed with, if there is a chain at the carriage end of the trace, the links of which can be put over a hook in the carriage.

The *pad* or *saddle* sustains the weight of the shafts by means of the tugs attached to it. For four-wheeled carriage horses it may be very light, as although it has to undergo some strain when the carriage is descending a hill if the horse has no breeching, or the vehicle is not furnished with a drag, yet this does not much affect the animal's back. The tugs ought to be of a proper length, so as to suspend the shafts at a proper height, which again depends upon the bend of the latter. If the traces are too long, the carriage is drawn by the tugs instead of by the traces, and this generally makes the horse

uneasy; while if they are too short the pad and tugs are pushed forward, and the crupper is rendered too tight.

For heavy draught horses, the saddle should be large, so as to ensure ample length and width of bearing surface, and be also well stuffed. These horses are much more liable to sore backs than light harness horses, because they receive less attention, and also because of the harder work they undergo, and the stuffing and lining of the saddles being allowed to become hard and lumpy.

The *breeching* is generally worn in single harness, but it is really only required when the carriage is heavy, to assist in backing it or in going down hill; when it is short, so as to prevent the front part of the vehicle coming forward on the horse, which might have a dangerous result. If a kicking strap is also worn, then the breeching must be longer; the strap should be sufficiently loose to permit the horse to trot without chafing his back, and it ought to be fastened to the shaft so that it lies two inches beyond the hip bones.

The *crupper* keeps the pad in its proper place, and is also necessary if a kicking strap is worn. Many horses, however, never like it, and often protest against its use by kicking. The part which passes beneath the tail should be smooth, and be kept very clean; it ought to be thick, linseed being recommended to stuff it with. The crupper is put on before the pad is put in its place, and great care should be taken to keep all hairs from between it and the under surface of the tail.

The bridle does not call for much notice. As "the instrument for guiding, restraining, and stopping a horse," it consists of the headstall and bit, with generally blinkers attached to the former, and very frequently what is called a "bearing-rein." The most important part of the bridle is the "bit," which, whatever may be its shape or dimensions, should act in such a way as to control the horse with little effort to the driver, and without irritating and paining the animal. It is very often the

contrary, however; for unfortunately, as has been truly remarked, from sheer carelessness and ignorance, a great deal of cruelty is daily practised on the horses of the higher and richer classes, in the way of ill-proportioned, ill-shaped, and ill-fitting bits, which, adjusted in a manner that converts them into instruments of torture, cultivate vice and create unsoundness.

Bad bits and bitting cause "hard mouths, make horses restless and runaways, and often seriously damage the lower jaw."

Whatever may be the shape of the bit, it should be light and properly fitted to the mouth. When too large it is almost as injurious as when too small. The mouthpiece should be exactly the width of the mouth, so that it fits close to the outer surface of the lips; most of the bits in use are too wide in this part, and if they have a port this fault is exaggerated in its ill effects.

The bit should also be in its proper place in the mouth, a short distance above the tush. If a curb-chain is employed, this ought to be rather loose than otherwise, and it should be somewhat broad.

The bits in ordinary use are the plain snaffle, the ring-snaffle, curb-bits, of various patterns—as the "Buxton," "Liverpool," "Chifney," etc., all of which have their admirers, and are adapted for different kinds of mouths, as well as to suit the hands of different drivers.

Perhaps no part of the horse's harness has given rise to more discussion than the use of the "bearing-rein." The object of this piece of harness is to relieve the strain on the driver's hands when the horse is impetuous through high feeding and insufficient work, knocks his head about, and is inclined to be fidgety and unmanageable. It is also of service in preventing the horse rubbing his head against the end of the shaft, or the pole (if in double harness), and so getting his bridle fixed, which might lead to serious consequences. Horses

heavy in hand are also supposed to be easier to drive when wearing a bearing-rein.

The rein is a part of the bridle, and is buckled either to a separate snaffle, if a double bridle is worn, or to the cheek of a Pelham bit—attached to the bit; it passes through rings affixed to the headstall, and is carried back to a peg or hook in the harness-pad. When properly applied, it should allow the snaffle to hang a short distance from the angle of the lips, and it ought to be of such a length that when the horse raises his head to trot it is then quite slack. Such a bearing-rein, so far from being an inconvenience or torment to the horse, if high-spirited will prove of assistance, and will certainly help the driver in averting accidents.

But the "gag" bearing-rein, and its usual mode of application, is an abomination and a cruelty to horses, and is applied to all alike in the same manner.

This is a round rein passing from a point of the headstall near the brow-band on each side, through a swivel attached to the snaffle-bit, through another ring, and then drawn so tight to the pad-hook that the corners of the mouth are rigidly drawn up towards the horse's eyes; added to this is a wide curb-chain linked up tight, so that the unfortunate horse is trussed up by the head to his tail, through the medium of the pad and crupper, and looks a perfect mockery of what he should be. When he has been driven for some distance or kept in harness for some hours, we can scarcely wonder that his suffering is great, while the physical damage done is sometimes very marked. It is against the abuse of the bearing-rein, when applied in this way, that all friends of the horse should protest. No sensible coachman who knows his business, and is not too lazy or indifferent to attend to it, will use the gag bearing-rein.

Horses doing hard work do not require bearing-reins; for heavy draught horses they should never be employed, as they

hinder them in working properly, and are of no advantage whatever.

The advantage of *blinkers* is very questionable. There can be no doubt whatever that fashion and custom alone sanction their use. Horses can be utilised better without than with them, and all horses should be trained to harness without them. They are not worn on harness horses in the army, and in civil life hundreds of horses are worked without them. They make the bridles heavier and more expensive, require more cleaning, cause the horse's head to be hotter, injure the eyes, and are certainly unsightly to any one who admires the noble animal. Blinkers ought to be abolished.

For pair-horse harness, the equipment should also be light and strong. Breeching is rarely worn, as the strain of backing and holding back the carriage is thrown upon the pole and pole-chains, as well as upon the break. Otherwise there is not much difference in single and double harness.

With regard to the harness of heavy draught horses, a word must be spoken in urging the adoption of that which is light, yet strong. Nothing can be more ludicrous and nonsensical than the massive, cumbrous equipment sometimes worn by agricultural, and even town horses—equipment which can only overburden them, add largely to the saddler's bills, and make the animals look uncomfortable and grotesque.

The cleaning, repair, and preservation of harness requires attention; but this is seldom neglected with that of light horses. With regard to heavy harness, Reynolds insists on every part being maintained in good repair; many accidents are occasioned, and not a few runaway horses made, by defective gearing. On many farmsteads, only rainy days, which are sometimes few and far between, are devoted to the cleaning of harness. Such neglect cannot be economical in practice; dirty collar and saddle linings are prolific causes of sore shoulders and backs. When damp from rain, or fouled by

perspiration, the linings ought to be thoroughly dried, and as thoroughly cleaned by scraping and brushing; while the leathers will be more supple, durable, and comfortable by frequent applications of pure neat's-foot oil.

DRIVING.

Skilful driving from a carriage implies the possession of those qualities which a skilful rider alone possesses, among which good strong hands, quick eyes, a cool head, judgment, courage, and patience are the most essential; while a good knowledge of horse nature is requisite to make the driver accomplished, and capable of undertaking the management of high-spirited horses.

To handle the reins properly is no mean art, and can only be acquired by experience added to natural qualifications. As has been already said, a driver of horses should understand harness and harnessing, and before mounting to the "box" or driving-seat, he ought to assure himself that the harness is all right and properly put on, and that the horse or horses are "put in" as they should be. Whether there be one or two or more horses, the reins should be in the left hand before ascending, though held loosely.

Unless the animal is an extraordinarily quiet one, some person should be in front of him holding his head, until the driver is fairly seated and the reins gathered up. The seat of the driver is an important matter, especially if one or more spirited horses are to be controlled. It should neither be high nor low, the driver being in such a position that, while *sitting* comfortably, he can use his body, arms, and legs to the best advantage in restraining and supporting his charge without feeling insecure. The body should be maintained upright and easy, the arms vertical, elbows near the sides, and hands in front of but not far from the body, and kept there.

Having carefully adjusted the reins in his hands—the left hand holding them, the right hand assisting—and holding them just so tight that bending of the wrists will guide, restrain, or stop the horse, the mouth of the animal should be felt, the amount of feeling depending on the kind of mouth and the bit the horse wears. The horse should be trained not to move until a few seconds after the driver is seated, and then he should walk for at least a few yards before going into a more rapid pace. Nothing, perhaps, is so injurious to limbs and feet as starting suddenly from a stand-still into a fast trot, and a large percentage of the foot-lameness of carriage horses is due to this cause. With nervous horses this precaution is more particularly necessary, as if set off hurriedly they are nearly always made unsteady and troublesome at the start, and even when standing.

"The *rationale* of driving may be compared to steering a boat. There must be no pulling and hauling, first on one side and then on the other; the slightest movement will be felt (on a well-broken, well-bitted horse) and anticipated—just as much pressure as is needful to keep the head straight; this pressure on either rein is, or should be, very slight." No more pressure should be put on the reins than is required to guide, check, or halt the horse, and the reins should only be used for this purpose—the animal being kept in remembrance that he is to obey the rein. If he will stand the whip (held always in the right hand), a slight touch on the right or left shoulder will make him obey the right or left rein, if he does not respond to it at once.

But the whip should ever be used sparingly, and only to awaken the horse's attention; rarely used to punish, and then only when punishment is really required. The abuse of this instrument is often really terrible, and deserves the severest reprobation. Often horses are cruelly slashed with it for no reason whatever, save that the driver is in a bad temper, is drunk, desires to "show off," is naturally brutal, or imagines it

is horsemanlike to ply his whip without stint. More especially do the unfortunate Hansom cab horses suffer from this abominable cruelty, which is only too often participated in by their fares inside, who hear and see the lash needlessly applied to the poor beasts without a word of protest—thus, in reality, encouraging the active perpetrator of the cruelty.

Brutal tugging at the reins is thought by these kind of drivers to be also workmanlike, and generally the whip and the bit are combined to render work a positive torture, without any countervailing advantage.

The whip should only be kept for emergencies, and for a *gentle* reminder when the horse's attention begins to flag. It is carried in the right hand, which also generally holds the right rein. "But when the driver and horse understand each other, and are in steady action, the reins may be trusted to one hand, while the whip is gracefully borne aloft in the other. Paradoxical as it may sound, it is much easier to drive and turn a pair of horses, *if they go well up to the bits*, with one hand, than a single horse; because the coupling reins, with a turn of the wrist, may be tightened so as to bring the outside horse intended to turn toward the pole, and the pole, acting as a rudder, turns the carriage. Therefore, in starting with either one or a pair of fresh horses, good coachmen take the reins in both hands; and in both hands must they be retained so long as there is the least probability of a horse turning to the right or left. So, too, a careful coachman always keeps his right hand conveniently near the reins held in the left hand, when driving one or a pair of animals of blood and courage."

With regard to pace, this must depend upon circumstances. If there is an emergency the pace may require to be forced; if the journey is short then it may be faster; if long, it must be proportionately slow. Something will also depend upon the condition of the horse or horses. Some will do six or seven miles an hour for several hours, but will be exhausted in a very

short time if pushed to ten miles an hour. The driver should know what his horse can do in the way of pace and distance, and above all, he ought to be cognisant of signs of fatigue and exhaustion.

If driving two horses, suit the pace to the slowest. Ease in going up hill or on rough roads, and make up time going down hill (if not steep) and on smooth and level roads. In very hot weather, horses should not be driven so fast or so long as in cold weather. On country roads horses may be allowed more head freedom, but in the crowded streets of towns they must be kept well up to their bits and on their haunches, so as to be more ready for guidance.

In starting, the horse should not be touched with the whip; he may be made to move by a signal from the rein or by a word, and when the whip has to be used it should always be applied to the shoulders.

We have already alluded to driving heavy draught horses. With regard to driving tandem and four-in-hand, the remarks just made equally apply; the special directions required can be best obtained from a practised hand, and practical experience can only be slowly acquired by handling the reins and "tooling" the horses under careful tuition.

CHAPTER VII.

THE TRADESMAN'S HORSE AND FAMILY PONY.

Tradesmen employ horses of different kinds, sizes and qualities, according to their requirements, and sometimes also according to their means and fancies. We therefore find them of not only different sizes and weights, but also of different degrees of breeding. Included in the list of tradesmen's horses, we observe these ranging from the heavy draught and van horse, to that of the butcher, greengrocer, and milkman's cart. It is needless to say that, in the selection and management of these, there is much to dilate upon, and yet special circumstances must determine the course to be adopted, and influence the results arrived at in these particulars.

Upon the amount and the kind of work will depend the kind of horse to be provided to perform it, and amount of food and attention the animal should receive. In the chapter on Feeding and General Management these particulars have been already dealt with, and, as pointed out, no fixed rule can be laid down with regard to the amount or kind of food which such horses should receive. One thing is certain, that it is not profitable—to say nothing of the inhumanity of it—to under-feed or over-work such horses. In proportion to the severity of the work should be the amount of nutritious food and rest; while comfortable, clean, and well-ventilated stables ensure health and liveliness. The times as to feeding, and the kinds and preparation of food, which have been dealt with in the chapter alluded to, should be adhered to as far as may be

possible, while the grooming should also be carried out as carefully as circumstances will allow.

One important point with regard to the management of the tradesman's horse which should not be overlooked, is the treatment the animal receives while it is at work. Perhaps no horse is more exposed to the danger of cruel treatment than this, from the fact that he seldom comes under the observation of his owner during working hours, and is only too often entrusted to the care of a man who may be indifferent to the animal's requirements or feelings; perhaps an ignorant, brutal person governed by a bad temper, liable to become fiendishly cruel by imbibing alcohol.

To protect horses from cruelty in every form is the duty of all; but in no form is it more repulsive, perhaps, than that it exhibits in the harsh and cruel treatment the tradesman's horse so often receives from the driver while at work. It is no rare event to see a brute of a fellow torturing and abusing a horse for no fault the animal has committed, but probably because he himself has made a mistake, or the horse has misunderstood him, or for some other trivial cause, or sometimes from no cause whatever.

Such cruelty is not only inhuman, it is a waste of property. Unkindness to animals is as damaging to them as overwork, for it materially diminishes their energy, breaks their spirit, makes them stupid, and shortens their existence; while kindness and encouragement are profitable, inasmuch as horses will do more work, and with increased intelligence, for a greater number of years. Cruelty, overwork, and insufficient or bad food, are the things to be guarded against in dealing with the tradesman's horse. Overloading and overdriving are no less to be condemned, and particularly that kind of bad driving so commonly indulged in by butchers' boys and men, which is as damaging to the temper and legs and feet of their horses as it is annoying and dangerous to those persons who have the

misfortune to witness it. Scarcely anything in connection with the management of horses can be more reprehensible or unhorseman-like than butchers' driving.

Tradesmen's horses usually work on the paved streets of towns and cities; therefore the legs and feet should be carefully watched, in order to keep them sound as long as possible. In this regard, too much attention can scarcely be paid to the management of the feet, and to shoeing. Good harness and proper harnessing are essential to the satisfactory performance of work and the comfort of the horse while performing it, as has been insisted upon in the previous chapter; and the value of a feed in the nose-bag should never be forgotten, if the horse has to be many hours away from his stable.

As has been mentioned, the amount of food, as well as the kind, will depend upon circumstances, but it should always be ample and of good quality. The probable quantity we have already stated; but it may be mentioned that for omnibus and cab horses in moderate or hard work, a daily allowance of from eighteen to twenty-two pounds of corn—a mixture of oats and maize, the proportion depending on the price in the market—with chaff (meadow hay and clover) from eight to ten pounds, is considered sufficient.

THE FAMILY PONY.

Ponies are much more in request in England than asses or mules, as, though not so hardy, or easily and cheaply kept, they are more docile and reliable, so far as temper is concerned, and are much more manageable. Their robustness of course varies with breed, climate, and mode of management. In some parts of the world, ponies are nearly as good as mules for transport purposes. Those from the hill districts of India, for instance, small, stout, and with strong limbs and feet, are well known for their endurance, vigour, and patience; while it is notorious that the ponies from over the North-Western frontier of India,

as well as those from Pegu, will carry as heavy a load as a horse.

It is not an easy matter to define what a pony really is—at least so far as height and weight are concerned. In some parts—as in Yorkshire, Leicestershire, and Northamptonshire—any horse under fifteen and a half hands would be designated a pony; and we are informed that the famous steeple-chase horse, the Lamb, which twice won the Liverpool steeple-chase, and was only fifteen hands two inches, was called "The Pony" by the professional reporters of his struggles and his triumphs. But in India that height is above the average of the Arab horses which our medium and light cavalry men ride, and which are always designated "horses," as the country rarely produces anything taller. Indeed, in this country many of the horses in light cavalry regiments are no higher than this.

In Nottinghamshire, a pony is considered to be an animal under fourteen and a half hands; but in Devonshire and Somersetshire it is recognised that any pony more than twelve hands high is the degenerate product of a cross between an Exmoor pony and some exotic steed.

Ponies were originally, and are now, bred and reared in mountainous regions, where there is generally no other food than the scanty natural herbage, and where, exposed to the weather of all seasons, they become inured to privation and neglect. They are merely large horses in miniature, probably brought to their diminutive size by the effects of climate, food, and exposure.

In this country there are localities renowned for the ponies bred in them, and which possess more or less distinctive characters, accompanied by certain attributes which render them preferable for particular purposes, or give them a reputation which stamps their value.

Shetland ponies are rather famous for their diminutiveness, symmetry, and endurance, no less than for their sure-footedness.

The pure bred ones rarely exceed twelve hands, and the smallest are pretty toys, sometimes no taller than an ordinary mastiff. Their usual colour is black, though other colours are met with, and the coat—as might be expected—is shaggy, with a long, thick forelock, mane, and tail.

A writer who, a few years ago, visited the Shetland Islands, thus refers to these little animals. "Every one uses the ponies of the country. The Norwegian colours—dun, with black mane and tail, and a black stripe down the back—are in request; bays and blacks are most common, greys and chestnuts scarce. Piebalds are to be found, but are not in favour with many native buyers, from the opinion that they partake of an Iceland cross, and are softer and slower than the true native Shetlander. They are often imported in great numbers at Granton (near Edinburgh) and Aberdeen. The best Shetlanders come from Unst. They are bred on a thin soil, studded with large red stones and kinds of rocks, amongst which one sees scores of ponies picking the green grass which the light of heaven and the breath of the Gulf Stream force up from a barren-looking bed. Unst may be regarded as the heart of Shetland—a sunny, genial-looking spot when other parts of the country are dismal enough in the late spring. If well kept the ponies reach forty-four inches (eleven hands), but the average is thirty-eight to forty-two inches. Each cottar has generally a few ponies on the hill, which they catch and offer to the dealers for sale in May and October. When the trade in ponies for coal-pits was at its height, five hundred were taken every year (not thirty mares amongst them), and about two hundred for general use, of all ages, from two to twelve years. These heavy sales, continued for some years, drained the Shetlands of aged ponies. Of late, the dealers' purchases have fallen off. In 1867 a good horse pony was worth £7; a mare, unless a wonder, was £2 less. The chief demand of mine-owners is in January and February. In the Durham collieries

Welsh ponies outnumber the Shetland. The Scotch have the lead in Northumberland, where larger ponies are required. The Scotch ponies, bred chiefly in Argyllshire, Mull, and Skye, and the western part of Ross-shire, average twelve hands two inches, the Iceland twelve hands, the Welsh eleven hands, and the Shetland ten hands."

Some of the best Shetlands are bred on the Balfour Estate, in Orkney; they are shifted from island to island, as the grass suits, and they require careful drafting to keep them down to nine hands in height (thirty-six inches).

The Exmoor is another breed of renowned ponies, much larger, but which seldom exceed thirteen hands, the best of which are said to be descended from crosses made with Dongola and thorough-bred stallions on the small native race. The Exmoor has a well-shaped head and small ears; the body, round, compact, and well ribbed; good quarters and powerful hocks, with straight, strong, and clean legs. The colour is usually bay, brown, or grey. He is noted for his sure-footedness and hardy constitution; and those bred by Sir Thomas Acland and Mr. Knight, which are to be found in October at Bampton Fair, are in particular request for family use.

Welsh ponies are also well known for their good qualities, though there are many different breeds of them, some of which have more breeding and are larger-sized than others, though these are not so hardy.

Ponies are also bred on Dartmoor, in the New Forest, and some other parts of England; and in Ireland—as in Kerry—there are breeds of robust, privation-enduring little beasts, which, when receiving anything like proper food and attention, prove excellent for household service.

Iceland ponies are a good deal used in this country, particularly in Scotland. They generally stand about twelve hands high, are said to be exceedingly hardy, and have strong legs and feet, while they are also strong in the back. Their

heads are somewhat large and heavy, and though very fast, these ponies are deficient in style and action, but they are remarkable for their endurance and sure-footedness.

Unbroken ponies can usually be purchased at horse fairs—those in England being generally from Wales and Ireland. It is well known that the best are those reared on mountain sides, where short, sweet herbage is to be found, and their robustness is accounted for by the weakly, crippled ones dying off during the severe winters, the strong-constitutioned ones only surviving; and the exertion these have to make over the rugged precipitous ground to obtain a living makes them active, well-balanced on their limbs, and safe on their feet. "A mountain-bred pony never falls unless over-weighted or over-tired, and it is very difficult to tire one. Ponies bred on wild rough land are certainly not so subject to the numerous diseases of an inflammatory character that are the curse of studs, where horses of the finest pedigree are reared with as much care and more expense than is bestowed on the most aristocratic babies. Like Red Indians, only those of stout constitution survive the hardships of infancy or foalhood; ponies that have reached maturity and been broken to harness or saddle, are more likely to be sound than full-sized horses, because only the best are worth sending for sale out of their native localities."

Ponies are used for carrying nursery panniers, for riding, and for harness.

A pannier pony should be very quiet and steady, rather small, but strong, with a round body and wide back; it should also be good in its walking pace—smooth and easy, and yet free from stumbling or blundering. Children should not be carried by it until it is well trained to carry a load, and to be led demurely. The bridle should be a snaffle, the bit being secured by reins to the flaps of the saddle, and a long rein being passed through the rings to lead with. Sometimes a light bamboo rod with a swivel spring-hook at the end, to fix

in the ring of the bit, or in the ring of a nose, is used to lead with.

A riding pony for children should be quiet, tractable, and a safe stepper. In addition to being well shaped, like a hack, for young boys, he should not be very round in the body; as if he is, he tires the rider's legs and does not afford a grip. If for girls, his width is not of so much importance, perhaps, as length to carry the side-saddle (which should have a crupper); but as in the other, he ought to have a good fore-hand, and the head and neck should be well carried.

Though all ponies may be ridden, yet only those which might be termed "hacks in miniature" are good for the saddle. But for harness, these, as well as those with heavy, upright shoulders and low withers, may be employed; indeed, ponies which may be considered very badly adapted for riding will be found sometimes excellent in harness; and for some purposes ponies are preferable to horses for driving, as they cost less to buy, are cheaper to keep, and generally last longer, while they are handy, and will often travel as far as, if not farther than, large-sized horses.

The management of ponies differs but little from that of horses. In the stable, the same sanitary rules are to be observed, and cleanliness in the way of grooming should be enforced. Feeding and watering ought to be attended to in the same way; though the quantity of food allowed will, of course, be less than for the horse, and must vary according to the amount of work performed, the size of the pony, and the season of the year.

A pony about thirteen hands high, performing a fair amount of work, should thrive well on fifty or sixty pounds of oats, and about the same quantity of hay, per week. An authority states that a pair of ponies, not over thirteen and a half hands high, in full condition for park display, can be kept well on one hundred pounds of oats and two trusses of hay

per week—the oats to be increased and the hay diminished if they are driven long distances day after day. It is generally estimated that a thirteen-hands-high pony will eat about half as much as a large horse.

When the work is very hard, a pound or two of beans may be substituted for a like quantity of oats, and a bran mash may be allowed at intervals.

Smaller ponies can do with less forage, of course; indeed, those doing little work will thrive on a very small allowance of oats, with plenty of hay—or even on hay alone.

CHAPTER VIII.

BREEDING, FOALING, AND FOAL-REARING.

THE breeding of horses is a matter that would require much more space for its consideration than can be devoted to it here, and it is one, moreover, which may be discussed from many points of view. Suffice it to say, that to breed good horses profitably requires patience, capital, and an amount of special skill and discrimination, which not many of those who attempt it possess. If it is an interesting occupation, it is nevertheless one in which very few succeed in gaining profit or renown; while as a science, still fewer can master its details. In the following remarks nothing novel is attempted in this direction, but only what experience has proved, so far, to be worthy of note by those who are about to venture on horse production.

The breeder of horses should know the kind of animal he is desirous of producing—racer, hunter, harness or riding-horse, hack, draught-horse, pony, or whatever else in that way circumstances or his fancy may lead or compel him to try for. Whether it is to be pure blood, half-bred, or cross, is another point which he should have decided before he commences operations; as it is surmised that whether he breeds for pastime or profit, improvement of the stock he breeds will be one of the objects he has in view. In the solution of these questions will be found the selection he makes of the parents; and the judiciousness, or otherwise, of his selection will in time be evidenced in the progeny.

It has been recognised that the progeny inherit invariably

a modification of the forms and attributes of the parents. Therefore as the latter are, so will the former be. "Nor is it necessary for transmission to offspring that any special form or quality possessed by a parent should have been by him or her inherited; an improvement once established in an individual, whether by inheritance or as a result of special management, is susceptible of transmission to succeeding generations, and by careful and intelligent attention to the selection of future partners for the offspring, the alteration may be fixed and become a typical character of the improved race. It must never be forgotten that not only are superior forms and attributes transmitted from parents to progeny, but that defects, malformations, and unsoundness, or the predisposition thereto, seem to enjoy an especial privilege of reappearing in succeeding generations.

"Some persons regard the qualities and defects of breeding animals in a relative, as well as in an absolute sense. For instance, they agree that a malformed chest or mis-shapen limb are defects absolute; but assert that flat feet are only positively defective when possessed by a stallion intended to be put to a mare having similar feet. And, further, that such faults are to be considered rather as desirable qualifications in the partner of an upright-footed mare.

"Personally, I can admit of no such qualifications, and believe it folly to expect that the mating of two animals, each having opposite defects of any kind, can result in anything but disappointment. Imperfections of conformation, constitution, or temper, cannot be so corrected, but are to be very gradually improved by careful attention to the selection of partners possessing perfect organisation, to oppose defects, and, still more, by the employment of well-directed external means calculated to ameliorate the particular fault.

"Physical and intellectual faculties, to be permanent, must have been fixed by transmission from parent to progeny,

through a series of generations. Recently-acquired qualities are ephemeral; they are transmitted with difficulty and destroyed by slight opposing causes. Peculiarities of form, size, colour, and constitution, with qualities, vices, and defects of all kinds, descend through remote generations, and it is not rare to observe in a foal distinctive characteristics identical with those possessed by grandsire or grandam, though absent in its proximate parents."

In breeding, therefore, the breeder should seek to combine, by carefully selecting the sire and dam, what he desires in the produce. It is a mistake to suppose that defects are easily got rid of in breeding; for instance, that putting a horse with a well-shaped head to a mare with a large or unsightly head, will ensure the foal having a good head. Nothing is more uncertain or more unlikely, and it is the same with other defects, and also with some hereditary unsoundnesses and tendencies to disease. To breed pure-bred horses, both sides—sire and dam—must be pure-bred; and to ensure sound and durable stock, the parents must be sound and vigorous; and not only so, but their parents, again, should have been in the same state, for there is a strange tendency to reversion towards defects and weaknesses which one generation may escape, but which will manifest themselves in a succeeding one.

No matter what kind of horse is to be bred—racer, hunter, or heavy draught-horse—the best of the kind should be selected to breed from; the most perfect in form for the purpose required, with a sound constitution, free from hereditary disease or defect, and good-tempered. It is by the system of careful and long-continued selection that our best breeds of horses have been raised; this, and appropriate food and stable management, has given us the mammoth draught-horse, the unmatchable hunter, and the fleet racer and steeplechaser.

What is called "in-and-in breeding,"—that is, breeding from animals closely related to each other by family—has been

practised by skilful horse-breeders with excellent results, so far as high-bred stock is concerned; inasmuch as it has assured the transmission of the special fixed qualities which have made certain strains of pedigree stock so famous and valuable.

As a writer on this subject judiciously remarks: "It is the only way to hand down the undiluted influence of some extraordinary animal, to perpetuate and give a fixed character to rare and desirable peculiarities and qualities, to produce an animal that will not be half one thing and half another, as most animals are; but will be all one thing, all one blood, one strain—one strong predominating tendency of form, quality, or character. It is evident that in the ordinary course of breeding, the character of any extraordinary progenitor must soon be lost. His son is only half his blood, and if the other half is entirely foreign, he has probably lost all power of transmission already. His grandson has only a quarter, his great-grandson only an eighth, the next remove one-sixteenth, the next one thirty-second, and so on. The extraordinary blood is lost, and may never be picked up again. On the other hand, by breeding in-and-in, we can preserve the rare blood and the rare qualities, and hand them down, little impaired, to millions of descendants."

But this consanguineous breeding demands the greatest care and attention, and should never be carried far, except for special and powerful reasons; as defects become intensified, and predisposition to imperfection of shape or tendency to disease greatly increased thereby.

"To get very fixed character, with undoubted power to transmit its qualities, you must often keep working on the same strain of blood, but under general circumstances you need not keep to what are called very close relations. The more closely you keep to one blood, so the more vigilant you must be to avoid the defects to which that strain has the strongest tendency, and to shun the slightest symptom of disease."

To improve a breed, "crossing" is often resorted to most beneficially; an alliance of different breeds or races giving origin to a stock which, if judgment has been exercised in assorting the parents, may combine more or less of the good qualities of the two families. It more frequently happens, however, that the progeny inherits qualities superior to one side and inferior to the other. So that the breeder has to decide beforehand what qualifications he desires to obtain, and what effect the mixture of races is likely to have on the produce.

The influence of the sire or the dam on the progeny is also to be taken into consideration. This, it has been noted, varies with the age, constitution, and breed of the individuals; and though it is asserted that the sire transmits conformation of fore-hand and limbs, as well as strength, energy, and capacity for work, while the mare gives height, size of the body, and shape of the hind-quarters, yet this is far from being the rule, and it has been observed that the more highly-bred one parent is, as compared with the other, the produce will generally take after the well-bred one—no matter whether this be the sire or dam.

It has also been remarked that the offspring of equally well-bred parents will more closely resemble the parent nearest in age to the prime of life, and possessing the most vigorous constitution; so that, if no particular influencing conditions come into play, the progeny will, if a colt, be like the stallion, and if a filly the mare.

Nevertheless, the influence of the sire is so important, that the greatest regard should be paid to him by the breeder, and especially in obtaining any special type, conformation, colour, or aptitude. More particularly, also, is this necessary in the matter of soundness. The force of this caution will be apparent, when it is remembered that a mare will produce only one foal in a year, while the stallion may be the sire of seventy

or eighty in the same period. Therefore it is that, to prevent the country being over-run with unsound, and for this reason comparatively worthless animals, a law should be passed (to protect the public, as well as breeders), prohibiting any but licensed stallions being used for procreation; such licence to be renewed annually, on veterinary certificate that they are free from hereditary disease.

In the matter of size, some persons, with the view to produce increased height in the foal, recommend the stallion being larger than the mare, while others advocate the contrary. No rule, it would seem, can be laid down for this, as circumstances of which we know as yet but little operate in this direction. Reynolds says that three of the best cart geldings he ever saw —all exceeding 16½ hands high—were bred from a little Welsh mare barely 15¼ hands in height; and he truthfully remarks that, as a rule, it will be found that a well-proportioned stallion, of commanding size, begets from low, wide mares, a better class of foals than when the relative proportions are reversed.

As before noted, the qualities desired in the progeny should be possessed by the parents, but if they are present only in one, then that should be the one which will most probably transmit them.

With regard to the age of the parents, it may be remarked that, while they can produce both when young and old, yet the best time is when they have arrived at mature age, or are fully developed and in the zenith of their vigour. Immature, or old animals, as well as those which have undergone severe toil and privation, often beget weakly stock. The stallion has more durability for procreation than the mare, some commencing at two years old and continuing until advanced age; instances are known of stallions being prolific for thirty years, and twenty years is not at all uncommon. But young stallions have to be carefully limited in their vocation, as excessive use checks their development and injures their hind legs; while the stimulating

diet they require to keep them vigorous is hurtful to their constitution, and predisposes to disease. On this subject, Reynolds (who is treating specially of heavy draught stallions, but his remarks are applicable to other kinds) states: Entire horses, which have not been forced by strong food, and have been but moderately used up to five years old, remain sound and vigorous to a good old age; and to a sound, hardy stallion of from seven to fifteen, or even more, years, possessing suitable qualifications, let me commend those breeders who desire good, strong, and healthy foals.

Mares breed from two years old up to twenty-five, sometimes; but after they are fifteen or sixteen years old their stock is not so good or strong. Though fillies will breed at two years old, yet this is rather early. Three or four is better, as they are then more developed and robust.

When mares have not been tried until they are advanced in years, and especially if they have been accustomed to high feeding, they often prove sterile; or if they do breed, parturition is frequently difficult.

Next to age, as favouring breeding, is the condition of the parents, and particularly the mare. Obesity is unfavourable, as well as emaciation. Robust health, ensured by good food and exercise or moderate labour, is conducive to this end. Mares doing regular work or at pasture, are much more likely to prove in foal, than those which are kept in stables, pampered, and little worked. The stallion should also be in good hard condition.

The number of mares a stallion should serve in the course of a season will much depend upon circumstances, but it is often controlled by his age and value. In many cases he is overdone and prematurely worn-out. A fair proportion of mares per season is given as from fifty to seventy.

During the season, the stallion must be well fed, but not fattened; the amount of food will depend on circumstances,

but it should be good. Oats and hay are the best articles, and for horses over five years of age a small proportion of split beans is advantageous. A small quantity of grass, clover, or tares, may be mixed with the hay. Above all things, recourse should not be had to physic (unless absolutely necessary), nor to drugs and hurtful substances supposed to stimulate the procreative faculty. Food is the natural and the best stimulant.

It is better to put the stallion to the mare twice within a very short period—twice in one or two days even—when possible, than oftener at longer intervals. The mare, of course, should be in a fit state, which is recognised by signs familiar to horsemen and horse-keepers, or by "trying" the stallion with her.

For a mare which has recently had a foal, the best time to show her to the stallion is about the ninth day after foaling. To make certain that she is impregnated, she is again shown in about twenty days after the first contact, or "service" as it is termed.

Sterility or "barrenness" may be due to various causes, some of which may be remedied by the veterinary surgeon, others are not removable. If it is owing to over-feeding and obesity, the remedy is obvious—less food and more work or exercise.

Mares may be bred from every year, or less frequently, according to circumstances; but when convenience will permit, annual breeding is generally recognised as most certain and profitable. Though there may be certain indications that a mare has conceived, yet these are not invariably present—even being in "heat" occasionally is not incompatible with pregnancy; in certain cases, when her condition must, if possible, be ascertained before the fifth or sixth month, a manual examination of the uterus by an expert may decide the question, but there may be danger in this. After the sixth month, the

fœtus may be seen moving at the right flank, especially after the mare has drunk a quantity of cold water.

During pregnancy mares can perform a certain amount of work, so long as it is not very heavy and is steady; indeed, slow and continuous work is advantageous to them until near, or even up to within a day or two of foaling, and if they cannot be worked they should at least have exercise—either voluntary, as in a paddock, or in hand. But towards the end of pregnancy, if not throughout the whole period—which is from 330 to 360 days—severe or straining work should be avoided, and a week or so before foaling it ought to be very light, if allowed at all. And for some time, if not during all the interval, the animal should be stabled in a loose box or roomy shed, apart from other horses, and with the view to prevent accidents, such as kicks, getting "cast," etc.

The feeding of a pregnant mare is of much importance with regard to her own health and that of the fœtus, and requires a good deal of judgment, if justice is to be done to both. Gross condition must be guarded against to prevent abortion, as well as under-feeding, which leads to debility of the mare, and bad development and feeble health of the foal. No fixed rule can be prescribed, as individual cases must be dealt with on their requirements. If the mare is working, then a little more food than is allowed to non-pregnant animals must be given. It is needless, of course, to insist that it should be of good quality. Grass alone may suffice for non-working mares, if it be sweet and nutritious, but towards the ninth or tenth month, an allowance of grain may advantageously be added. For heavy draught-mares doing no work, unless they are very young or old, or it is in the depth of winter, green and chopped forage, with pulped roots, will suffice. Reynolds recommends mashes or bruised oats or barley, associated with pulped roots and chopped hay or straw, moistened with linseed-cake water, for draught pregnant mares at work; as these articles form a sub-

stantial and at the same time a non-exciting and easily-digested diet. He also adds that maize is not a suitable food for such mares, as when it constitutes a chief part of their grain allowance the foals always exhibit general weakness of muscle, and abnormal relaxation of the ligaments of the joints.

Food should be given at frequent intervals, as long fasts are injurious, especially when they are succeeded by over-repletion.

If possible, clean fresh water should be provided; and if at pasture, provision ought to be made to shelter brood mares from extremes of heat and cold. Care ought also to be taken that the animals be not frightened or chased when near foaling; and young horses or cattle should not be pastured with them, lest injury be inflicted and abortion produced. This accident is due to a number of causes, but in the mare it is generally injury which brings it on, though in some animals there is a predisposition to it from malformation or disease. Improper diet, illness, over-exertion, exposure to bad weather, fright, drinking too much cold water, poisonous plants, frosted food, etc., may all operate in causing such an accident.

When abortion occurs early in pregnancy, it is often unobserved, and causes but little apparent disturbance in the mare; but when it takes place later it is very noticeable, and sometimes serious in its results. It usually takes place suddenly, and without any of the usual premonitory signs of parturition, though there may be a good deal of distress preceding and accompanying the expulsive effort. When the fœtus dies and is not expelled, there may be no immediate indications of its death, but in a short time a foul-smelling discharge will take place from the external genital parts, showing that putrefaction has set in, and the dead creature will come away, or require removal; the mare will also be dull and feverish, or uneasy and restless. Veterinary assistance should in all these cases be sought, particularly if the dead fœtus or

its membranes are retained. If there are other pregnant mares, they should be removed from the immediate neighbourhood of that which has miscarried, and cleansing and deodorising of the box ought to be carried out as speedily as possible.

FOALING.

It is well to know the signs of approaching parturition, as if the mare and her produce are valuable, it may be desirable to have an attendant with her, in case she requires assistance.

Such an occurrence is not very frequent in the equine species—not nearly so often as in the bovine—yet with highly-bred and artificially-kept mares, and particularly with those of the draught breeds, as well as those which have had several foals, which causes the belly to be more pendulous, difficult birth and a fatal termination are not very uncommon.

Towards the end of pregnancy the belly drops, the hind-quarters and the flanks sink inwards, the movements of the young creature are seen to be more active, the external organs of generation become rather swollen, and the mare is dull and sluggish. The udder also becomes enlarged, and it begins to secrete a fluid. This is an important sign, and if it is desired to ascertain when parturition is likely to take place, a good index will be afforded by the nature of the change that occurs in the secretion—a change which can be demonstrated by milking the mare. At first, what may be called the milk is a dark-coloured, thick, and sticky fluid, but about a day before foaling it becomes white, and has the ordinary appearance of milk. This indication is particularly valuable when it is determined to have the mare attended to during the birth of the foal.

Parturition in the mare is usually a prompt act, and is accomplished without assistance, if the full time of pregnancy has been reached, and if there is no deformity or obstacle in

the mare herself, nor yet in the young creature. The most frequent cause of difficult foaling is usually due to the latter being in a wrong position. Usually the head and fore-feet come first—the former being uppermost and between the latter, and the enveloping membranes are intact, generally, until the body has been partially or wholly expelled.

The mare becomes uneasy, and moves about. Labour pains or contractions set in suddenly and almost violently, the abdominal muscles being those visibly involved. Soon the head, feet, and shoulders appear externally, then the body, and finally a powerful expulsive effort extrudes the hind-quarters: this portion of the act being accelerated by the traction caused by the weight of the fore parts of the foal, which hang down against the mare's hocks—these forming a kind of launching stocks or break in descent for the safe deposition of the new-born creature on the ground, as the mare is generally in a standing position when birth takes place.

Should the expulsive efforts be violent and continuous for a longer time than usual, which is sometimes the case with the first foal, or if the mare is very fat, the circumstance demands attention, and provided the attendant is sufficiently skilful and careful, a manual examination may be made in order to ascertain the position of the fœtus—whether it has entered the passage, and if so, whether it is in the attitude most favourable for exit. If it is not yet in the passage, a little more time should be given for it to get there; or if it is there and is in malposition, then it will be necessary to adjust it and otherwise assist the mare in delivery.

But all this requires so much experience and skill, that but few men, beyond those specially trained to obstetrical work among animals, and gifted with strength, patience, tact, and rare manipulatory dexterity, can do anything beneficial in difficult parturition in the mare. If, however, the attendant cannot call in skilled aid, and has to rely on his own judgment,

he must remember that great harm is often done by what Reynolds correctly designates "premature and unnecessary meddling." He should make re-examinations from time to time, and if increased room is but tardily provided, he must take care, by securing the parts presented, that the fœtal position does not become changed from a natural to a mal-presentation, through the continued and violent throes of the mare. Dilatation of the passage may be assisted by gentle and well-applied traction upon those portions of the fœtus that are naturally presented.

But the causes of difficult labour, and the means to be adopted to overcome obstructions to delivery, with the treatment of the patient after parturition, are so numerous, and belong so intrinsically to the science of veterinary surgery, that they have no place here. Whenever serious obstacles to delivery exist, the aid of an experienced veterinary obstetrician should be promptly sought, and no violent tractile efforts made until his arrival; but if the membranes are ruptured, as they probably will be before it is considered necessary to obtain skilled aid, it is wise to secure with cords the head or legs of the foal when easily practicable.*

To deliver a large powerful mare, frantic with distress and pain, is indeed a labour of Hercules for the most experienced.

When parturition is delayed through weakness of the mare, assistance is required in the form of stimulants—such as brandy in gruel, with properly-timed pulling of the fœtus when the parturient spasm comes on.

Under ordinary circumstances, nothing more than cleanliness, good foods and comfort, are required for the mare; if, however, there is exhaustion present, gruel to which two or three ounces of brandy are added may be administered once or oftener, as the case may demand. When the mare, through

* See Fleming's "Veterinary Obstetrics" for full information on this subject.

weakness or any other cause, foals lying down, and does not get up at once when the young animal is expelled, so as to tear through the umbilical cord (navel-string)—which is the natural way of preventing hæmorrhage—it will be necessary to tie it firmly with a piece of tape or cord in two places two or three inches apart, severing it between these places.

The enveloping membranes of the fœtus (or "after-birth") come away a short time after delivery, as a rule; if they do not, they may be allowed to remain for a day or two. After that time, if they are not expelled they should be removed manually, and if they have begun to putrefy, the passage and the uterus ought to be cleaned out by injections of warm water, followed by an injection of a dilute solution of Condy's fluid, to prevent blood-poisoning.

It is recommended that after foaling, aged mares with large pendulous bellies should be relieved by supporting this part with an evenly adjusted wide bandage, passed several times round the body.

Rarely does the straining continue after the birth of the foal and the expulsion of the membranes; should it, however, do so for some time, even when the latter have not come away, they may be acting as an irritant, or something else may be wrong which requires the intervention of the veterinary surgeon.

Interference between the mare and the foal is not often needed, the former instinctively attending to her progeny, if undisturbed and good-tempered, cleansing it and allowing it to approach the teat. Sometimes, however, through fear or temper, the mare will not tolerate the foal, and gentle persuasion is necessary to induce her to do so. They ought to be left together quietly for a short time, the mare meanwhile becoming accustomed to the novel situation in which she finds herself, and being tranquillised by gruel and hay. When she allows the foal to suck, and begins to lick it, she will not require

further inducement. It has been the practice to sprinkle a little flour over the back of the foal in such cases, in order to tempt the mare to begin licking it.

In cases where the foal appears to be born dead, and does not breathe, it may be yet living, but will promptly perish unless respiration is at once established. The mouth should be opened and sponged out with cold water, the nostrils and face also sponged and blown upon, the body being in the meantime well rubbed, and flicked smartly on the sides of the chest with a cloth—sometimes dashing cold water on the chest will cause inspiration, and set the function of breathing into play. In these cases, when the foal survives, as well as when the mare will not allow it to come near her, the young creature should be made comfortable by drying its body with a soft cloth and rubbing its ears and legs.

Though the mare and foal will thrive under cover, or in a box or stable, for two or three weeks, yet exercise is necessary for both, and in eight or ten days after foaling it should be allowed regularly. This is best secured by turning them both out to pasture if the weather be fine, in the daytime, and if the weather be warm and dry they may even remain out during the night; but the mare should, in the latter circumstance, receive hay and whatever food may be necessary, and especially if she has not much milk for her offspring.

If the mare is in good milking condition and strong, and if the pasturage is good, little, if any, additional food than this supplies will be required after a short time. Some mares have an excessive secretion of rich milk, either from their natural development or from the highly-nutritious character of their food, and if the foals are allowed to indulge too freely in it at first, they are liable to suffer from indigestion or some other serious disorder. To avoid this, only a portion of the milk should be allowed the foal, a quantity of it being withdrawn from the udder several times a day, for a few

days after birth, until the young creature can safely digest it all.

Should the supply of milk be scanty and grass not abundant, scalded oats mixed with good bran, or perhaps better, mashes of boiled barley, are useful—such mashes may have added to them some salt and treacle, to render them more palatable and milk-producing. Oatmeal or flour gruel is also good. The udder should be frequently and gently rubbed, and the foal often allowed to try the teat. When it cannot obtain sufficient milk after a short time, it must be reared artificially, or, which is in every way preferable, put to another mare, or fed with another mare's milk.

When brood mares are suckling, and they cannot be depastured, then they should either receive cut grass or good hay, boiled barley or scalded oat mashes, and if procurable, pulped roots, with an abundant supply of good water.

Attention should be paid to the udder of suckling mares, as it is liable to become hot, hard, and painful—inflamed, in fact. If this condition is serious veterinary advice should be obtained; but if slight, fomentation of warm bran-water, gentle friction with the same, and frequent milking, will probably quickly relieve it. A changed or reduced diet will, in some cases, be necessary; but unless the foal can be taken off, physic or other medicine must not be given.

Draught and harness mares are sometimes put to work while suckling, but it is not judicious to do this until a month has elapsed since foaling, and then food must be given in proportion to the amount of work, which should neither be heavy nor fast, nor should the mare be kept many hours from the foal.

The foal is usually weaned at from four to six months, and this should be gradually effected—the intervals between the times being extended until the foal can entirely subsist on the food it is able to masticate; the food of the mare is somewhat

reduced at the same time, and if the flow of milk is undiminished, harder work may be enforced, with dry food and a smaller allowance of water. It may even be necessary to give physic to check or abolish the secretion. Natural weaning is often a longer process with mares kept for breeding only.

Should the foal die while being suckled, the same care of the udder is necessary as in weaning, but purgative and other medicine may then be administered to suppress the milk secretion.

FOAL REARING

Nothing is more important for the future well-being of the foal than judicious rearing during its early years, as then its constitution is most impressionable, and its development receives an impetus which ensures good muscle and bone, with perfectly-formed organs; or this is checked, and we have feebleness, insufficient growth, organs that are unsound or badly perform their function, and a constitution that will not endure strain—all depending upon careful or neglectful rearing. When half-starved and badly kept for the first two or three years of their lives, no amount of attention will afterwards compensate for the lost opportunity of promoting free growth and full development in the foals.

Therefore it is that the wise breeder will see to it that foals and young horses have a plentiful supply of good and proper food, sufficient exercise, and pay attention to their feet, limbs, and body. Their growth and condition, while being suckled, should be watched, and diarrhœa and constipation guarded against, as they are quickly pernicious to the well-being of the young animals.

If allowed to suck the first milk, constipation is not likely to occur in the young foal; nevertheless, it may happen, and to guard against it a dose of castor-oil is often given soon after birth. This does no harm, and may be productive of good.

Diarrhœa is a very serious disease in foals, and should be guarded against by keeping them and their dams in healthy places and comfortable. When it appears it must be checked immediately by the exhibition of a dose of castor-oil, given in a little milk or gruel, and afterwards small doses of alkaline medicine—such as bicarbonate or biborate of soda, with a few drops of tincture of iron, and if there is straining or evidence of pain, a similar quantity of laudanum. Boiled rice or starch-gruel should be used as the vehicle of these medicines, as well as food in small doses at intervals. The body should be enveloped in a soft warm blanket, and the dwelling kept clean and comfortable. As the mare's milk may be the cause, the foal should be kept from her except at short intervals, and her diet ought to be changed, while tonics—as iron—and alkaline medicines, may be beneficially given to her.

If the foal, because of the death of the dam or other reason, has to be reared artificially, cow's milk, diluted with water and a little sugar added, will suffice in some cases; in others the foal will not thrive upon it, and in lieu of a portion of it bean-milk has been used most successfully. This is prepared by boiling beans almost to a pulp, taking away their shells, and pressing them through a fine hair sieve. A very little salt may be added to the cream-like fluid or paste, which may be made thinner when about to be given by the addition of the diluted cow's milk.

Foals soon begin to masticate, and when a month or two old, if necessary and convenient, a small quantity of scalded oats made into a mash with bran (a little salt being added), when given every day will stimulate growth. Some breeders even add boiled beans or peas to the mash, and Reynolds says, speaking of draught-foals, that a half-pint of beans gradually increased to a quart per day, is of greater benefit than twice the quantity allowed at two or three years old.

When weaned, the same care should be exercised in giving

such food as will produce muscle and bone, though the rearing should not be forced so as to produce obesity; and plenty of exercise is as necessary almost as food.

During the first year grazing will give exercise and food to some extent; but as growth is rapid at this time a good supply of artificial food should not be withheld. Oats, crushed, should be the chief grain, and a small proportion of beans, split, mixed with these, the whole being scalded or boiled if possible, and bran added to form a mash, is good and appropriate feeding, together with sound hay. In winter shelter is necessary, during the night at least, and the allowance of food must be increased. Until two years old the same treatment should be continued, and voluntary exercise allowed every day; but if a number of foals are together, the fillies ought to be separated from the colts, and the question of castrating the latter has to be considered, as also the advisability of completing the rearing in the straw-yard or at pasture. With regard to the last question much will depend upon circumstances. Whichever course may be decided upon, the food aspect of rearing must not be neglected, as under-feeding is far from being economical; and though it is very desirable to handle, and even work animals at two and three years of age, yet as they have not reached maturity, long-continued or severe labour is most reprehensible, as it brings about premature decay.

CHAPTER IX.

BREAKING AND TRAINING.

The education of a horse is generally included in the words "breaking and training," and is commenced and carried through with the object of making the animal tractable, and subservient to the requirements of man. The time to commence this education is when the animal is young and impressionable, and especially during foalhood; but of course this is not always possible where large numbers are bred, especially in the open, and with but few attendants. Then what might be designated "heroic horse-breaking" has to be adopted with animals perhaps two or three years old, which may never have been handled, and are in a more or less wild condition.

With those in paddock or at pasture, however, and which are under the immediate influence of civilisation, handling should begin soon after birth. Horses differ very much in disposition and temperament—in this respect they are but little, if at all, different to the dog—and their intelligence, tractability, and docility differ widely among themselves. Some are naturally stupid and difficult to teach; others are so nervous and shy that teaching alarms them, and makes them so excited that it is very difficult to secure their attention and confidence; others, again, are stubborn and perverse, and require tact and humouring; while there are others, also, though it may be surmised they are in a small minority, who are naturally, if not vicious, at least recalcitrant and spiteful.

But it must be confessed that, to those men who can

understand horse nature and horse character, there is no great difficulty in breaking and training young animals very easily and satisfactorily. Each animal must be handled and humoured according to its temperament and tendency; but it may be laid down as a rule, that kindness and firmness should be the principles governing horse-breaking and horse-training. It only too often happens, however, that the opposite principles prevail, and that all young horses are subjected to the same invariable routine of bullying, beating, and stupefying by noise and worry, no matter how diverse they may be in their temper and intelligence. Hence we need not wonder that there are troublesome horses—animals vicious or unmanageable, which, had they been entrusted to men who understand them, in their early days, might have been most placid and tractable: servants instead of would-be masters. Tact and gentleness should always be preferred to harshness and brute force, in managing young horses.

It is a good plan to accustom the foal to be handled at a very early age; the head, legs, and body being stroked and patted, the feet lifted, and the voice employed to coax and reassure it, a reward in the shape of a bit of bread, a little oats, or anything else tempting, being given immediately afterwards, if obedience is readily yielded. It is well also to accustom the foal to wear a light head-collar of leather or hempen band, close but easy-fitting, and not likely to get entangled in anything. At first this may be worn only for a short time, and in putting it on there should be no force used, as the majority of foals are particularly impressionable, and their first lessons have often a long, if not a lasting effect. By this head-collar he can be held, led about, turned and restrained, gradually and steadily, until he becomes so well accustomed to handling that he will not object to it, and will even like it.

When "haltering" has not been attempted until the

animal is weaned, or even later, there is often great difficulty experienced, and much patience and tact are generally required to effect it. In only too many instances it is achieved by brute force, with perhaps a certain amount of cruelty and terrorisation. "A farmer has a colt he wishes to halter; so he gets his men together and drives the colt into a yard or stable. A man then hangs on to the timid animal by one of his ears and his nose, another man seizes his tail, whilst three or four more men push against either side of the poor frightened beast; then ensues a struggle. The colt, frightened out of his senses, and not knowing what is required of him, fights the half-dozen men clinging to him; he rears, bites, and strikes with his fore-feet. The men on seeing this, and the farmer standing near, say he is a savage brute, and must be reduced by savage means. The colt is then beaten with a broom or pitchfork-handle, his tail is twisted, and every means of inflicting excruciating pain is resorted to, which, instead of subduing the animal has the reverse effect—the colt being driven to madness, struggles and fights until he vanquishes his foes. There is then a consultation between the farmer and his men, and at last this ferocious beast is haltered by stratagem; but throughout all his life he is either vicious or extremely nervous and shy, for he will never forget his first introduction to mankind, and the rough usage he then encountered."

In such a case as the latter, the colt (or filly) to be haltered should be quietly induced to go into a yard, stable, or loose box—either by leading, driving, or the enticement of a horse led before him, with a man or two on each side at a little distance to prevent him getting away—everything being conducted silently and soothingly. When in the yard or stable, if a horse has been employed as a decoy, he should be removed and the door closed, only one man being left with the colt, which should be allowed to survey and smell at leisure until satisfied that there is nothing dangerous present. After a

time, the man should retire for a short space, and return again to put on the halter. This article should have a "shank" about eight feet in length, with a knot tied in it to prevent its running tight and pinching the head if the animal pull on it. The man must approach softly and slowly, keeping his hands down and speaking encouragingly, until, on reaching the colt, efforts may be made to touch and stroke him, without alarming, until the hand has been worked up the neck towards the head. One hand can pass the "shank" over the neck and tie it round that part; this will give a hold of him, and the halter can then be worked on to the head. After being patted and talked to for a little, a light, but strong, leather head-collar may be placed on the head over the halter, and then he should be watered and fed, and left alone. The head gear is left on, and on the following day he is handled again, a rope is tied to the head-collar, and he may be led round a few times, then tied up—if he is uneasy or struggles, stroking and speaking to him will reassure him, and he will soon become tranquil. After half-an-hour of this, the halter may be removed from under the head-collar, as well as the rope from the latter, and the animal left to himself. Next day this is repeated, after which he may be turned out into a paddock or straw-yard and allowed to amuse himself. It is recommended, as a good practice, to allow colts two or three years old to run in a large straw-yard or field, with the shanks of their "halters" hanging loose, before they are subjected to further restraint, taking care that the headstalls—which, as said before, should be of leather—are properly adjusted, and that the hempen shanks are securely twisted into a coil during the night. This, however, is somewhat risky, as in running about, the animals will be continually placing their fore-feet on the end of the shank, and so tugging their heads, injuring their limbs, or throwing themselves down. It is better either to have the shank, if it is to be worn, coiled up short to the headstall, or tied round the neck and attached

to a lock of the mane, to prevent the fore-foot getting through it during grazing or rolling.

Leading and longeing should be commenced when the colt is fully accustomed to the head-collar and to head manipulation. This is best affected by a cavesson well fitted to the head, and with a long leading line of webbing attached to the front ring of the nose-band (which should be well above the nostrils), by means of a spring swivel. This being put on, the colt is allowed to leave the stable or yard, and followed up or led without any driving or pushing until a convenient place (as quiet and retired as possible) has been reached, where lessons can be given. Should he struggle and fight, tact and firmness must be displayed—speaking to him quietly and reassuringly, and keeping a steady hold of him, not far from his head, if necessary. As he becomes calm, and confident that no harm is meant, then more lead may be allowed until he is some distance off, when the breaker, standing firmly on one spot, begins to teach him obedience by inducing him to move round in a circle at a walk, trot, or canter. It is well to have a whip, which if possible should be carried by a second man who stands outside the circle; but it must not be used in any way until other means of persuasion have failed. As a rule, if tact and patience are exercised, there is not much difficulty in all this. Circle him round in one direction at a walk for a short time, keeping the cavesson line tight, and pulling him to a standstill every now and again, and making him obey commands; patting him also at intervals, and strengthening his friendship by a handful of corn or anything he likes to eat. Then the direction of movement should be reversed, and the same procedure gone through, care always being taken, from the very beginning, to employ certain words for certain things the colt must do, in order to familiarise him to them and make him know what you require of him.

Too much of this longeing must not be given at one time,

nor must the colt be made tired; after an hour or so, repeated two or three times a day, he should be taken home and fed. In a day or two of this training he may be led in a circle, and by degrees in a straight line. A good authority advises a whip to be carried on the second day of leading the colt in a straight line, in order to teach him always to walk with his shoulder opposite that of the trainer's. His head should always be in front of the latter, whose body ought to be on a level with the fore-arm and shoulder of the animal; otherwise, if the head is level with the trainer's, the colt will gradually begin to hang back, he will be taught to drag in hand, and ever afterwards he will have to be pulled along when led. To prevent this habit being acquired, he ought to be led with the cavesson rein in the right hand, the left hand carrying the whip, and whenever his shoulder drops behind the trainer's, he must be touched gently *behind*, when he will step up to his proper position immediately. By doing this, and watching him carefully, in a few days he will be taught to lead well, keeping always level with his attendant and not hanging back, and so spared from much ill-usage and beating in after days in not requiring to be pulled along.

When the colt leads well, a well-padded surcingle, with a crupper attached to it—the latter having a buckle near the tail to facilitate passing it under that part—is put on. The surcingle should have three D rings on the upper part, one in the middle by which to attach the crupper, and one (or a buckle) on each side for the reins. A bridle is also put on the head, or a bit attached to the cavesson.

The bit is of various patterns. One is a large smooth snaffle, with keys hanging from a central ring; another is a thick, smooth, straight bit; another is a large straight wooden mouthpiece; another is a circular bit, consisting of a smooth ring with a loop at either side to attach it to the bridle; while another has a smooth semicircular mouthpiece. The best is,

perhaps, the large smooth snaffle with keys depending from its ring, as no movement of the tongue can raise it from the lips or gums, while the colt can easily play with and enjoy it, instead of fighting against it, as he is likely to do with most of the others. It is generally considered necessary that the bit should be large and smooth; and to prevent it being drawn through the mouth, it should have guards at the sides.

Whatever bit may be employed, it ought not to be drawn up tight into the corners or angles of the mouth, nor so low down as to come into contact with the incisor teeth, but be placed opposite the space behind the chin where the curb-chain usually lies, and close above where the tush grows.

These things should fit easily and be put on quietly. The reins must not be fastened to the bit for two or three days. When the colt has on the bit, surcingle, and crupper, he is allowed to stand quietly in the loose box until he becomes accustomed to them; then he may be circled with them a few times on the longeing ground, and taken home for water and feed, the bit, of course, being removed from his mouth. In two or three hours afterwards he is taken out again, bridled a few times, then led along roads or lanes to accustom him to see and pass unfamiliar objects—the quietest places being first selected. If frightened at anything, he must be quietly dealt with and assured of safety: patting and speaking to him, allowing him to approach and examine whatever scares him, and passing it backwards and forwards a few times if possible.

This training ought to be gone through morning and afternoon, the morning's work being commenced with a little longeing. The reins may be attached to the bit on the third day, and buckled evenly to the surcingle, but they must be rather slack. For a number of days he should be led through more frequented lanes, streets, and in towns, and gradually accustomed to all kinds of noises; the reins, meanwhile, must be gently tightened by shortening them a hole every day until the

animal carries his head vertically, but not more than this. In about a fortnight he should be longed in the cavesson rein alternately attached to each side of the bit, so as to make him understand "side pressure" on the mouth, making him do the same amount of work on the one side as the other, so as to keep the mouth equally sensitive on both sides. But this must be only of brief duration, lest the mouth be made sore.

A few days of this, and he may be driven in long reins in the longeing ground or a field, turning and stopping him now and again, allowing his head plenty of play, and not pulling at it too much, so that, in a short time he may have a good mouth. After using reins for a day or so, he may be driven by them about the roads, instead of leading him.

All this time, of course, the hind and fore legs of the colt have been handled and lifted, the hoofs taken backwards and forwards as the farrier manipulates them, and struck with the hand or a piece of wood; while the body may be rubbed over with a cloth or "duster."

The common practice of placing a colt in the stall, head about, and fastening him to the pillar-reins by the bit, is not to be recommended; it often teaches him to lean upon the bit and to "bore" on it, in uneasily moving his mouth from one side to the other.

At this time, if the colt is intended for draught, pieces of harness may be put on him, and an open collar placed on his neck to accustom him to the pressure of it. If he is for heavy farm work, then he ought to be accustomed to the rattling of chains behind him.

Reynolds, speaking of draught-colts, remarks that to those which have lived in open fields the confinement of a stable is at first irksome, and they should not be subjected thereto until they have commenced to do a certain amount of work. If the demand for team-work will allow of delay far enough into the spring, it is better for the newly-broken colt, when his work is

completed, to be pastured at night with his companions in labour; the daily meals to be partaken in the stable with his associates, will gradually and pleasurably accustom him to the change. It is an almost universal custom on light-land farms to work a colt when two years old, and at three years old off he generally constitutes one of an ordinary team. On stronger soils, the commencement of labour is sometimes postponed for six or twelve months longer. When put to work for the first time, no coercion should be employed to make the colt draw; yoked with a team of steady old horses, and led for a short time, he will soon take to the collar voluntarily.

It must be noted, when treating of breaking and training, that the stable management of the colt is not to be overlooked. Gentle treatment, combined with firmness, is as essential in as out of doors, and the teasing and teaching of tricks so often practised by stablemen and boys should be rigidly prohibited. Secure fastening up of the colt in the stable is another point which should receive due attention, the halter and its attachments being sufficiently strong and secure to prevent breaking loose.

If put beside other horses, care should be taken that these are quiet and will not tease; also that they have no bad habits —such as crib-biting, weaving, biting, kicking in the stable, etc., which are so often imitative.

The trainer, or attendant, has to remember that to overwork a young colt, either in training or when commencing to work it, is unwise, as in addition to the danger of weakening him, much fatigue often makes him apathetic, lazy, or even vicious. The work should always be in proportion to his strength.

When animals do much work on roads—especially if these are very hard and stony—their hoofs become broken and worn; these, therefore, require protection by iron shoes, and the services of the farrier are needed to apply the latter. The

shoeing of a colt for the first time is an important matter. It is assumed that the legs and feet have been handled according to the directions already given; therefore, when it is decided that the colt is to be shod, the day and hour should be fixed when he is to be sent to the forge, as he very often becomes tired and restless if he has to await his turn there.

If the animal is very fresh and spirited, it may be advisable to have him exercised or longed before he is sent, or if he is nervous and excitable it may even be necessary to make him very tired.

Upon the manner in which he is shod for the first and second times, will often greatly depend his quietness during this operation in the future. The noises, sights, and smells of the shoeing forge are novel and startling, and timid, restless colts are very often much disturbed on their appearance there for the first shoeing. If it can be done, it is a good plan to allow the colt to pay one or two visits to the forge before the operation is required. Sometimes, indeed, the farrier has either to visit the colt or the latter to visit him, in order to have the hoofs shortened or straightened; and this is a good preliminary training.

During shoeing the colt should not be tied up, but his usual attendant ought to hold him by the head, talk to and stroke him, and allay his fears; the farrier meantime going about his performance quietly, gently, and without unnecessary pulling or force. The fore-feet should be shod first, as they generally demand shoeing most, and are generally more easily done; the hind feet require more time, and are usually most troublesome for the farrier. Therefore, if the colt is very combative, which he may be through fear, obstinacy, or being tired of the operation, it may be better to leave the hind ones for another day's rehearsal.

If the colt is to be trained for riding, he has to become accustomed to the saddle. This article should be shown him,

and he ought to be allowed to smell and feel it with his nose. Allowing him to look at and touch everything with his nose, is a good way to accustom him to it. There should be no stirrups to the saddle, and it must be put slowly and gently on his back—moving it from the withers to the croup and forward again, until he does not object to it. Then it may be girthed very slack, or secured around the body with a surcingle, which the colt is already accustomed to. After a short time it may be fastened on more tightly, and a crupper may be added as before, together with a breastplate. All this takes time with nervous colts, but it is not lost time; for the animals are having explained to them, or at least the attempt is being made to make them understand, a most essential part of their duty.

The colt may now be led out and longed with the saddle on, after which he may traverse roads. Another lesson on the same day may be with stirrups attached to the saddle, and even extra straps, with a horse blanket rolled up and tied on the top, while a piece of cloth may be attached to the crupper at each side, to accustom him to things dangling about him. With these, he should be walked, trotted, and cantered on the longe until quite settled to them.

In one or two days he should be mounted; but before this is attempted, he must be well longed with the saddle and its appendages on; after which he is taken back to his box, if large enough, or to a shed or other convenient quiet place. A martingale is sometimes put on, but this is sometimes in the way if the animal fights with its fore-feet, and even the reins are sometimes so. What is called a "French" or "Dutch Martingale" is very effective in keeping the reins out of the way, and steadying the colt's head without constraining it. It is merely two rings in one piece—two rings joined together—through which the reins pass. To put these through, they are unbuckled in the middle, each is passed through a ring, and

they are then buckled again over the withers, when the martingale will be between the colt's chin and breast.

Not only is the ordinary martingale in the way, but it is often used to give the trainer a good purchase and enable him to hold on. This is most objectionable, as a man who requires such assistance is certain to give the colt a hard mouth. There ought to be very little, if any, pressure on the reins, for light hands are all-important in mounting a young horse.

If the colt is pretty steady and quiet, he can be mounted without much trouble. The girths should be moderately tight, all straps and buckles secure, and the crupper easy. The reins are then gathered in the left hand, the trainer's left side placed to the colt's left shoulder; his left foot is then quietly raised into the stirrup two or three times, each time a little more weight being placed in it; when, if the animal takes kindly to this, the body may be raised in the stirrup, both legs being off the ground, and the animal being talked to softly and soothingly. After standing in the stirrup for a second or two, the trainer descends, and again ascends until the colt is used to this movement and the weight, when the right leg can be thrown gently over, taking care not to touch the back, the weight being supported by the right hand, which grasps the pommel of the saddle; the right leg is then lowered into its proper position without touching the side until seated in the saddle, and the foot placed in the stirrup. The rider now sits motionless, except to pat the animal's neck and caress him, speaking to him kindly and pleasing him. No attempt should be made to make him move. After a few minutes' seat, the rider dismounts as quietly and methodically as he mounted—releasing the right foot from the stirrup, bringing the right leg over the back, halting a few seconds in the left stirrup, patting and speaking to the colt, and then descending.

This should be repeated a few times; then the animal is brought out of doors to the longeing ground, and mounted in

the same quiet way, though on no account should he be urged forward. Contending with him at this period is by all means to be avoided. If he chooses to move at a walk and in a circle —as he has been accustomed to do at this place, good and well; he must not be checked for a time, but gradually brought to feel one or other rein, so as to be induced to go at last where it is desired. There must be no pulling or jerking at his mouth, nor urging with the legs. An hour or two of this— according to his temper and will—will suffice; then he is taken to his box, caressed and fed, and the lesson repeated again in the afternoon.

Riding the colt twice a day for three or four days in this way, in a field, is the best training, and it is better, at first, not to take him from home or his associations. If at any time during these early days he becomes refractory and unpersuadable, he must not be fought with; it is better to dismount from him, and longe him in a circle or lead him for a time, and then mount and try him again. He is like a child, and must be humoured at first and taught as children are, by degrees. Obedience is the thing to be taught, and this is better inculcated by kindness and firmness than by bullying and beating, which in nearly all cases produce confusion, stupidity, stubbornness or vice. Intelligence can be largely cultivated in horses, by teaching them under favourable conditions; these conditions rest with the trainer, as much as does the production of a good light mouth. To do things well, the colt must understand how and when to do them. To punish him for not doing them, when he has not been properly taught, or if so, has not been informed when or where to do them, is stupid and cruel.

When accustomed to the guidance of the reins, the leg should be brought into play for a similar purpose, and then the colt may be ridden on public roads, in which there should be plenty of room, in case of his shying or proving unsteady if

he chances to see or meet with strange objects. Timidity and shying are best met with kindness—speaking soothingly and patting. If inanimate objects scare him, he must be made to know, by looking and smelling at them, that they are harmless. It may happen that at this advanced stage, some colts may, on occasions, endeavour to obtain the mastery, and gentle persuasion will not overcome them and render them obedient. If punishment is necessary (here the trainer's judgment comes in), and whip and spur must be used, *then they should be well applied and at once*, as man must be the master. Only, the colt should understand what he is punished for, and acknowledge his mistake by rendering ready obedience afterwards.

After a fortnight or three weeks, an ordinary plain snaffle bit may be substituted for the breaking or mouthing bit, and then the paces can be taught.

The paces of the horse are the walk, trot, canter, and gallop. There are other artificial paces, such as ambling, pacing, running, etc., but they are not usually recognised in this country.

Walking is, perhaps, the most important pace, and the one to which the riding horse should be trained carefully. A slow, bad walking, or jogging horse is most unpleasant in the saddle, and particularly on long journeys. Though the ordinary walking pace of a saddle-horse in this country is, perhaps, at the best, not more than four miles an hour, yet training may bring this up to five or six miles for short journeys.

This is a natural pace and requires no special training, though to develop and improve it needs tact, time, and patience, like so much else in horse management. It is begun to be taught with a light hand on the reins—just feeling the colt's mouth, and allowing his head ample liberty. He should never be allowed to break from the walk into a jog trot; if he does so, he ought to be pulled up at once to the walk—stopped, if need be, and made to begin the walk again. This tendency

to break must be guarded against in every way, and therefore slow walking is best to commence with; when taught to understand that breaking is objectionable, then faster walking can be allowed. But it does not answer to keep the colt too long at walking lessons, and he may be trained to the trot at the same time, the two paces being adopted alternately; but the transition from one to the other should be clear and marked —walking a mile and trotting half-a-mile, changing from one to the other being brought about by the reins, or by the leg or spur, which should also be used to accelerate the speed of either pace. An hour of this tuition is enough at a time, and twice a day should be sufficient. When he understands how to walk, he must then be made to walk fast and true, without any breaking into the trot until required to do so. Months will be required to train a horse to walk well, but it is worth all the time and trouble, and youth is the best time to teach it.

The *trot* is taught rather differently to the walk. There are three kinds of trot—the jog-trot, true trot, and flying trot. The first is a most objectionable pace—no faster than a walk, and harassing to the rider, it should be discouraged; the second is the one most patronised and useful; and the third is the accelerated trot of the trotting matches. The true trot is the one to be taught for general utility.

The trot is generally commenced from the walk, and is begun by gathering up the reins, so as to feel the mouth more strongly and cause the colt to lift his fore limbs higher, bend his knees better, and bring the hind legs well forward under the body, in order to produce that free action which is not only pleasant to the eye, but desirable for the comfort of the rider. The bit keeps the animal together and in check, while the leg, heel, or spur incite him forward. He should lead off always with the right fore-leg, if possible, though some horses can never do this well with that limb, but naturally and most

comfortably commences with the left. A lady's horse should lead with the right leg. The lesson, as in walking, should not be long nor fatiguing, and if trotting in a circle the direction must be reversed frequently.

Cantering is a slow gallop, the colt being urged from the walk or trot, and well restrained by the bit while being urged forward, the right fore-leg being the leading one. To make a horse lead with one or other fore-leg, the head is slightly bent round to the opposite side.

Galloping does not require any special training other than allowing the animal liberty to extend itself, while stimulating it to put forth its speed.

Leaping should, if possible, be taught when the colt is young, and without any kind of coercion or punishment. If commenced at two years old, when the colt is not yet saddled, the teaching should be begun by the animal wearing a cavesson, or a snaffle-bridle with a thin rope fastened to each end of the bit. In the latter case a man holds on each side by the rope, and a third follows with a whip. Very small jumps are attempted at first: boxes, rails, or sheep troughs placed in a row, then placed on each other, until from stepping over the colt has to jump. Small ditches should be led over in the same manner, and when they are readily taken, wider ones may be tried. In this way the colt will soon jump hurdles, banks, walls, and wide ditches, without hesitation, and even with pleasure, so long as the jumps are not too difficult at first—in fact, they ought to be particularly easy; but the obstacle to be jumped should always be something that will compel the animal to clear it well, else he will jump carelessly. He ought not to be allowed to feel slovenly, and success should be rewarded with encouraging words. Whatever he is desired to do should be done thoroughly and neatly.

Sometimes a ridden horse gives a lead over the jumps, the colt being led over in the cavesson, and the man behind with

the whip inducing him to follow; but he should never be punished nor disgusted.

If the colt is sufficiently strong to be ridden, which is not often the case under three years old, and has been ridden, then the best way to train him to jump is to take him out to harriers or hounds, just to show him them; when he is accustomed to the sights and sounds, he might follow a lead in a small jump or two—the force of example is most potent, and a lead should always be given until proficiency has been attained. Common sense, firmness, and kindness, will soon effect wonders in teaching jumping; the object is to give the animal confidence in his ability, and rouse a spirit of emulation in him by giving him a lead, letting him get abreast with his leader, and allowing him to lead him after a time.

Refusing to jump, or "baulking," should, if persisted in, be met with punishment, but only on these occasions; while slovenly jumping should be corrected by making the colt go over something prickly, such as gorse, or a stone wall, a stiff wooden bar, or a felled tree.

It must be remembered, however, that jumping cannot be perfectly taught some horses—indeed, there are some which are unteachable; while to others it comes naturally.

The colt must be ridden quietly at his fences and with somewhat light hands, so as to leave his head easy, allowing him to take his jumps as a matter of course, and merely keeping his head straight at them.

Breaking to Harness is quite as important, if not more so, than breaking to saddle, and requires as much attention, patience, tact, and kindness. The same preliminary training is necessary as regards handling. An easy-fitting, well-stuffed, and smooth-lined collar, opening at the top, should be provided; it ought to be put on, and the colt exercised in it for a short time, then the other portions of harness may be added, and exercise or longeing given in them. Next day attach

ropes, long leather straps (reins) to the collar, the ends of which should be held and gently pulled at by an assistant, while another leads the animal, starting and stopping him now and again, but never making him unsteady by jerking pulls, and allowing the lines to touch his hocks and quarters now and again.

It is best to break to harness without blinkers, for reasons already given; but if they are to be used, now is the time to put them on.

To accustom him to the pole of the break, that part should be placed beside him, laid against his body, and rubbed over him. He must on no account be alarmed by it, but should tolerate it about his legs, and in a day or two, when he understands it, he will have no fear of it. He ought also to be led about carriages and near carriage wheels, and alongside horses in harness, so as to become used to wheels behind him. Then he may be put in a light break, along with a steady, but free, old horse, and gently and encouragingly started to travel along a straight, level road, the harness being sound and well put on, and the break attachments strong and secure. It may be well to have a man run alongside the colt for a short distance to encourage and steady him, going slow at first; indeed, a walking pace is the best to begin with. Only a short journey should be taken for two or three days, and at the end of each the shoulders and neck must be carefully examined to prevent chafing from the collar. Should the skin become tender, there is nothing better than alum solution sponged over it.

The colt ought to be driven on the near and off side alternately.

When steady and obedient in double harness, if intended for single harness also, the colt may be trained in a light, but strong, carriage—two-wheeled, if possible. The harness must be good, and a kicking strap is necessary with strong breeching.

Care is needed in putting him between the shafts for the first time, and when gently started he should be led for some distance on a level smooth road, until he is reassured and calm. The whip must not touch him, and starting should always be quiet and steady. Sudden stopping and jibbing must be carefully guarded against; the harness and bit should fit well and comfortably, and on the management of the reins will depend the development of the horse's intelligence, the sensitiveness of his mouth, and his obedience.

It is needless to say that none but good-tempered skilful men should be allowed to break horses to harness; while they are even more necessary to cure horses of those bad habits and vices so readily acquired during early years, through bad breaking and training.

CHAPTER X.

THE ASS AND MULE.

THESE animals, though but little used in this country, in comparison with the horse, are nevertheless of much value for certain kinds of work, and especially under particular conditions. Their usefulness is generally overlooked or ignored, either through prejudice, dislike, or from the nature and capabilities of the animals not being understood, leading to mismanagement and consequent disappointment. In certain circumstances and for special requirements, as in the field during war, the ass and mule are better than ponies or horses; and in the country, and even in towns, they might be largely and advantageously employed—indeed, mules are preferred to horses in several countries, and form by far the largest proportion of the animals used for work.

THE ASS.

The ass is characterised by great hardiness of constitution, endurance of fatigue and hunger, patience, and apparent indifference to privation, while he is sure-footed and little liable to disease. In this country the ass is but little utilised, his services being generally limited to costermongers, gipsies, small tradesmen, hawkers, and sometimes for carrying young children or sea-shore riding. In some other countries, however, he is in more repute, and takes a somewhat prominent share in load-carrying, and even in draught. In France, in 1866, there were

518,837 of these animals, the numbers having gradually increased up to that date, while their improvement had also kept pace with their larger numbers. This improvement was more especially directed towards furnishing the best possible asses for mule production, which is a somewhat important industry in France and Spain, and for this purpose the stallion ass has been brought to a high degree of perfection.

The asses of France, Tuscany, Spain (Andalusia), Persia, Asia Minor, Arabia, and Egypt, are extolled for their large size and good qualities; and in the United States of America, and also in South America, these animals are valued chiefly for their share in mule-breeding. In France, those found in Gascony and Poitou are recognised as the best for this purpose.

The Spanish ass is nearly double the size of that with which we are familiar in England, and in the Island of Bahrein, in the Persian Gulf, there are said to be donkeys exceeding in size those of all other countries. As a general rule, the ass is large and smooth-haired in warm countries, small and long-haired in colder ones.

According to the country, the breeds of asses, and their strength, they are employed to carry or draw loads, or as riding animals—rendering, in fact, though on a smaller scale, the same kind of service as the horse. The peculiar qualities of the ass render him, in certain conditions, particularly valuable, and these can be greatly developed by good food in sufficient quantity, and careful attention in breeding and general management. This is proved by what is seen in Asia, Arabia, in some parts of Africa, and in the south of Europe, where this animal is much stronger, taller, altogether better shaped and graceful to look at, while better able to endure fatigue and privations, and faster and pleasanter paced. If possessed of less brilliant qualities than the horse, the ass in those countries has them of a more varied character, and can consequently be put to a greater number of uses.

With us, the ass is only too often utterly neglected, and left in the hands of those who brutally maltreat him, by semi-starvation, beating, over-working, and insanitary maintenance. It can scarcely be matter for surprise, then, that the creature is dwarfed and decrepit, spiritless, sulky and resistive—nay, vicious, and proverbially stupid; when, under opposite conditions, he is intelligent, and a most willing and useful servant of man. Even in the abject state of slavery and neglect in which we generally behold him, he renders good service in his way, and probably no animal does more work on so little food.

In some countries the flesh of the ass is eaten; and the asses' milk, holding a kind of middle place between that of woman and the mare (equine)—being rich in sugar, and containing less butter and caseine—has long been extolled for its medicinal properties, especially in chronic disease of the lungs and the digestive organs.

In agriculture, and in several branches of manufacture and commerce, the ass might be profitably utilised when circumstances permit or require his special qualities to be brought into play—qualities which are not found in the horse or pony.

Asses are used more in the East for carrying loads or packs than in this country, or even in Europe; though in hilly countries where the vine is cultivated, his special aptitudes render him particularly useful in carrying the manure up the narrow, rugged paths, and bearing the grapes down to the homesteads during the vintage. For the saddle he is also much more employed in the East than in Europe; in Egypt and Syria he is in common request for this purpose, and the donkeys of Bagdad are celebrated for their good qualities as riding animals.

The load for a donkey to carry any considerable distance, varies with the size and condition of the animal; but the maximum weight is usually fixed at about 100 pounds.

In no other animal, perhaps, is good feeding, kindness, grooming, and housing, more amply compensated for by increased service and willing performance than with the ass. His appetite is not large, and he is much less fastidious about the quality of his food than the horse. A few pounds of hay and oats in the course of the day and night will maintain him in excellent condition, and even on hay or grass alone he will perform a fair amount of work; but if the toil is exacting the food should be in proportion. A large-sized ass will get through a wonderful amount of work on half-a-dozen pounds of oats and eight or ten pounds of hay. Few, however, receive such an allowance as this, unfortunately; but more frequently they have to labour hard on a little inferior hay, or the grass and weeds they may chance to pick up between or after the hours of toil.

The shoeing of the ass demands special care. From the structure of his peculiarly shaped foot, he is very easily pricked by the nails, and this accident is often followed by tetanus (lock-jaw), to which he is strangely predisposed, and which is so acute and fatal in him.

In purchasing an ass, the age is judged by the teeth, in the same way as in the horse, and pretty much the same diseases and defects should be looked for. The limbs should be strong; the knees and hocks large and free from blemishes; the feet not too small, and the hoofs sound; the chest wide; the back unscarred; the body rather long, but compact; the hindquarters and croup round and wide.

The ass should not be put to hard work under four years of age.

THE MULE.

Intermediate between the horse and the ass, in nature and in utility, comes the mule. For certain purposes, this hybrid is superior to both, combining in himself several of the good

qualities of the horse and ass, and few, if any, of their bad ones. As an American writer on the mule says: "There is no more useful or willing animal than the mule, and, perhaps there is no other animal so much abused, or so little cared for. Popular opinion of his nature has not been favourable; he has had to plod and work through life against the prejudices of the ignorant. Still, he has been the great friend of man, in war and in peace serving him faithfully. If he could tell man what he most needed, it would be kind treatment. We all know how much can be done to improve the condition and advance the comfort of this animal; and he is a true friend of humanity who does what he can for his benefit."

The mule is but little used in this country, though his services might be largely made available, especially in agriculture. He is much stronger than the ass, is more capable of bearing fatigue than the horse, is less restive under the pressure of heavy weights on his back, and his skin being harder and less sensitive, renders him capable of resisting better the sun and rain. He lives as long as the horse, costs less, is more suitable as a beast of burden, and is far superior in sure-footedness. He can do more work daily than the ox, but is perhaps more expensive to purchase; while he is dearer to keep, as the ox can be turned out to graze, but some suitable food must generally be provided for the mule, if he is doing work.

It has for centuries been recognised that, for general purposes, the mule is the best of military transport animals, for which his special qualities eminently fit him: he being frugal, patient, possessed of great endurance, slightly affected by heat or rain, easily fed, and equally good for burden as for draught; he walks well, picks his way easily on bad roads, moves by the side of a precipice with much safety, and passes over every description of ground, independent of roads.

He is long-lived and seldom sick, though his infirmities are generally acute. He is said to be easily alarmed by the noise

of firing, by thunder, and by violent thunder-storms; though perhaps he is not so liable to mad panic as the horse.

The principal mule countries in Europe are the South of France, Spain, Portugal and Italy. The French mules are found on the borders of the Pyrenees, in Gascony and Poitou; of all these, the best are those from the neighbourhood of the Pyrenees. Mules are used in Spain in the Catalan provinces, in the mountainous districts of Andalusia, and in the province of Alicante. Good draught mules come from La Mancha; in the districts on the slopes of the Pyrenees mules are much used for pack. During the Abyssinian expedition, mules were purchased at Cyprus, on the coast of Asia Minor, in Egypt, at Bagdad and Bushire, and in the Punjab provinces of British India—so widespread is the breeding-ground for mules.

Good mules are also reared in North and South America. The principal provinces for mule rearing in the United States are Kentucky, Missouri, and Kansas. The Kentucky mules are of good build and showy; those from Missouri are hardy animals, well able to endure privation and hardship. The mules of Old and New Mexico, bred by a jackass out of a mustang mare, are also very hardy, robust, and serviceable animals, pronounced superior to those of the United States. The mules from the district between the Tigris and the Persian frontier have a very good reputation, as have also those of Poitou, in France.

Mules are rarely employed in any capacity in this country; as pack-saddle carriage, for which they are so well adapted, is seldom resorted to anywhere, and then perhaps donkeys are preferred. Though largely used for draught in some countries, yet it would appear that they are not so serviceable in towns and cities as in the country.

An American writer says with regard to the use of mules: "Proprietors of omnibuses, stage lines, and city railways, have, in many cases, tried to work mules, as a matter of

economy; but, as a general thing, the experiment proved a failure, and they gave it up and returned to horses. The great reason for this failure was, that the persons placed in charge of them knew nothing of their disposition, and lacked that experience in handling them which is so necessary to success. But it must be admitted that, as a general thing, they are not well adapted for road or city purposes, no matter how much you may understand driving and handling them.

"The mule may be made to do good service on the prairies, in supplying our army, in towing canal boats, in hauling cars inside of coal mines—these are his proper places, where he can jog along and take his own time, patiently. Work of this kind would, however, in nearly all cases, break down the spirit of the horse, and render him useless in a very short time. . . . The mule, especially if large, cannot stand hard roads and pavements. His limbs are too small for his body, and they generally give out. You will notice that all good judges of road and trotting horses like to see a good strong bone in the leg. This is actually necessary. The mule, you will notice, is very deficient in leg, and generally has poor muscle; and many of them are what is called cat-hammed."

In harness they often prove remarkably serviceable in heavy ground and in mountainous countries, where they are said to be better than horses. An observer writes: "In South America, mules are more used among the mountains (than horses), a habit probably introduced from Spain. They are perhaps better with the average driver, although they will never make the pace that good horses will do. They are not so excitable; they are more easily made reliable at a pull; they are far more certain to take care of themselves; they are even more clever in ascending and descending excessively steep places than either the horse, the ox, or the zebra; but in running down ordinary hills they are far more liable to stumble or fall on their knees than an ordinary horse."

Their pace is slower than that of the horse, notwithstanding the many reports published as to their being equal in speed to him. "I have seen it asserted that there were mules that had been known to trot a mile in harness in three minutes. In all my experience I have never seen anything of the kind, and do not believe the mule ever existed that could do it. It is a remarkably good horse that will do this, and I have never yet seen a mule that could compare for speed with a good roadster. I have driven mules, single and double, night and day, from two to ten in a team, and have handled them in every way that it is possible to handle them, and have in my charge at this time two hundred of the best mule teams in the world, and there is not a span among them that could be forced over the road at the rate of a mile in four minutes. It is true of the mule that he will stand more abuse, more beating, more straining and constant dogging at him, than any other animal used in a team. But all the work you can get out of him, over and above an ordinary day's work, you have to work as hard as he does, to accomplish."

The mule is one of the very best beasts of burden man possesses, and for this purpose he is employed chiefly in mountainous countries, and those in which wheel carriage cannot be resorted to. He is also greatly in request for transport purposes during war; his patience, robustness, and endurance of hardship and fatigue, rendering him particularly well adapted for the exigencies of field service. The mules of Asia Minor, Syria, Cyprus and Mexico, are famous as pack animals.

As is known, the mule is a hybrid between the horse and the ass. That which is the produce of the male ass and the mare horse is the most valuable, and that which is generally bred; that between the horse stallion and the mare ass is perhaps more gentle in disposition, but is not nearly so hardy. The "henny," or "hinny," as this creature is termed, has generally the legs and feet, and mane and tail of the horse—

sometimes even the head; it is nearly always small in size. In rare instances, the animal will have the fore-quarters of the horse and the hind-quarters of the ass.

The voice of these animals usually betrays their lineage, for while those of the first kind bray like the ass, the second kind neigh like the horse.

Mules also inherit the shape and peculiarities of the sire to a greater degree than those of the dam; from the latter they obtain size, but rarely inherit bad shape or unsoundness from her. In the great majority of cases—ninety per cent.—the donkey transmits his shape and soundness to his progeny.

A writer says: "If any gentleman wants to purchase a mule for the saddle, let him get one bred closer after the mare than the Jack (stallion ass). Such an animal is more docile, easier handled, and more tractable, and will do what you want with less trouble than the other. If possible, also get mare mules; they are much more safe and trusty under the saddle, and less liable to get stubborn. They are also better than a horse mule (male) for team purposes. In short, if I were purchasing mules for myself, I would give at least fifteen dollars more for mare mules than I would for horse. They are superior to the horse mule in every way. . . . The most disagreeable and unmanageable, and, I was going to say, useless, animal in the world, is a stud (stallion) mule. They are no benefit to anybody, and yet they are more troublesome than any other animal. They rarely ever get fat, and are always fretting; while it is next to impossible to keep them from breaking loose and getting at mares. Besides, they are exceedingly dangerous to have amongst horses. They will frequently fly at the horse, like a tiger, and bite, tear, and kick him to pieces. I have known them to shut their eyes, become furious, and dash over both man and beast to get at a mare."

The popular notion, that to obtain a good mule colt, large

mares must be bred from, has been shown to be erroneous. The average-sized, compact, serviceable mare, is the best to breed from; in fact, the mare and Jack should be of the average size, the latter being well marked and the best of his kind. The only advantage in employing large mares is to give the mule larger bone in the limbs, with good-sized hoofs—points in which the ass is usually deficient, and the mule generally more so, while his body is, in the majority of cases, heavy.

Mares 14 to 14½ hands high, put to the largest donkeys, produce good mules for draught or saddle; for pack, the best size for mares is between 13 and 14 hands.

Large mules are not generally preferred, as they are inconvenient to handle, and have often weak limbs, while they eat as much as horses. The most usual and convenient height is from 13 to 13½ hands, the average being 14 to 15 hands.

But these points can rarely be obtained, as the mare, even with good legs and large solid hoofs, breeds close to the ass, and particularly in these parts. With these exceptions, the nearer the foal approaches the sire the better, as the best mules are those which have the asinine marks most developed, and have the deepest of the different colours. Spotted and dappled mules, as well as those which are white, or have a white muzzle and white rings round the eyes, are considered weak and of little value for work. Those which have the characteristic black stripes round their legs, black manes and tails, and black stripes down their back and across their shoulders, are generally the best.

With regard to age, a mule is scarcely full grown at five years, and though he may be worked much younger than this, yet the labour should not be heavy; until six or seven years old he is not fit for full work. Mules live and work longer than horses—a mule at thirty years old is supposed to be equal to a horse at twenty.

The best mules are those with a good appearance, having a broad chest, strong neck, bright eye, fine strong legs, large hocks and knees, a good length between the point of the shoulders and the withers, and a moderate sized body. A narrow chest, large belly, light limbs, small feet, and turned in hocks, are defects in conformation. Mules with straight backs are best suited for bearing burdens; those with a hollow back for saddle or draught. The male mule can carry more weight than the female, though the latter is better for work, being more docile.

Being tall, heavy, and fat is no criterion of serviceability. A mule measuring $14\frac{1}{2}$ hands high, to be in good working condition, should not weigh more than a thousand pounds; heavier than this, his legs will probably soon give way.

A great deal of care and patience are required in breaking-in mules to work, as their temper is more readily spoiled than that of the horse, and bad treatment will make them more afraid or defiant of man than they naturally are. The breaking should be gradual, and calmness and gentleness are very necessary. To train a mule properly, it is necessary to establish, from the very first, confidence between him and the trainer, and men of irritable temper should not be allowed to undertake the task. It is necessary to avoid allowing the animal to acquire a vice while training him, as he will probably never forget it; and nothing is more profitable at this period than good treatment. Once the trainer has gained the confidence of the animal, he can teach him to do almost anything. Therefore it is that well-bred and well-cared for mules, which have been gently broken in, will be found almost as good, and as tractable and docile, as horses. Bad training and ill-treatment ruin their temper. The mule is easily frightened by noises and strange sights, and time should be given him to realise that they are harmless. The animal's ear is particularly sensitive, and

rough handling of it, or the slightest injury, will make him frightened and stubborn.

Speaking of training, an American remarks: "Owners and raisers of mules should pay more attention to their habits when young. And I would give them this advice: When the colt is six months old, put a halter on him, and let the strap hang loose. Let your strap be about four feet long, so that it will drag on the ground. The animal will soon accustom himself to this; and when he has, take up the end and lead him to the place where you have been accustomed to feed him. This will make him familiar with you, and increase his confidence. Handle his ears at times, but do not squeeze them, for the ear is the most sensitive part of this animal. As soon as he lets you handle his ears familiarly, put a loose bridle on him. Put it on and take it off frequently. . . . Nothing is more important than that you should bridle a young mule properly. I have found from experience that the best way is this: Stand on the near side, of course, take the top of the bridle in your right hand, and the bit in your left; pass your arm gently over his eye until that part of the arm bends his ear down, then slip the bit into his mouth, and at the same time let your hand be working slowly with the bearings still on his head and neck, until you have arranged the headstall."

Gentleness in working and managing the mule is also very important, though it is seldom observed; and there can be no doubt that much of the prejudice against the use of this animal is due to the bad temper or unmanageableness he manifests through cruel or improper treatment of him, by those who either do not understand his disposition, or imagine he should be treated with harshness and violence.

Harness for mules should be strong and well made, and the collars and pack-saddles well fitted and easy. The bit should not be too thin or strapped too tight, lest it may produce a sore mouth, which is very difficult to heal, and during the

continuance of which the animal cannot eat well, and may become irritable.

Mules, and especially small ones, can carry 30 per cent. of their own weight; the load may be estimated at from 200 to 300 pounds. A team of four mules, driven two and two, will, if of good size, draw a load weighing 50 cwt., in addition to the waggon, at the rate of four miles an hour on a good road.

A mule with a load on its back will walk a little over three miles an hour; but the same pace should be maintained throughout, for either trotting or slow moving, and especially long halts, tire and injure the animal.

Mules show by their gait when they are fatigued. They should, therefore, be carefully watched, so as to abstain from pressing them when they exhibit signs that their strength is exhausted. A tired mule droops his head, his neck becomes horizontal, and the ears fall back immovable. So long as he has strength, the ears remain erect and incline forwards; as soon as he begins to fan his ears—to allow them to swing backwards and forwards, it is an indication that fatigue is beginning to tell on him.

With regard to food, in the United States mules generally receive, in towns, a mixture of maize and oats in the proportion of 1 to $1\frac{1}{2}$, the quantity of the mixture allowed per diem varying, according to the size of the animals, from 4 lbs. to 10 lbs. Together with this grain ration, from 6 lbs. to 12 lbs. of hay is given. Small mules are, in some instances, fed only twice daily, morning and evening.

The experience gained in wars shows that the mules from Egypt, Persia, and India, thriving on little grain and coarse grass, are more hardy and enduring than the Spanish, which, being finer bred, require better food to keep in good working condition.

They should be groomed and kept comfortable, but they

must not be too much nursed and pampered, as they then become delicate, and less able to withstand hardship and exposure to weather.

More care is required in shoeing mules, perhaps, than horses, in consequence of the formation of their feet, which partake of that of the ass. Their diseases are also similar.

CHAPTER XI.

SHOEING, AND DISEASES AND INJURIES OF THE FOOT.

In order to understand the general principles of shoeing, a glance at the different parts of the hoof is necessary. The "wall" is that portion which surrounds the foot, and is alone seen when this is placed on the ground. It is fibrous in structure, the fibres passing from above to below, as they grow from where the skin terminates. Externally, these fibres are dense and resisting, but those nearer the interior gradually become soft and spongy. The growth of the wall is indefinite, it being the part which has to sustain wear through contact with the ground.

When the foot is lifted, the sole and the frog are seen on its lower or ground surface. The "sole" is usually more or less concave in a healthy foot. It is fibrous, like the wall, its fibres passing in the same direction; but they are much softer, and their growth is definite, they breaking off in the form of flakes when they have attained a certain length. The "frog" is a triangular mass of somewhat soft and elastic fibrous horn, situated at the posterior part of the sole. Like that part, its fibres are also of definite growth, and flake off in large patches from time to time.

The wall sustains weight and wear on all kinds of ground; the sole is adapted for sustaining weight, on soft ground more particularly; while the frog has a most important use in acting as a cushion to support the powerful tendon which flexes the limb, in diminishing jar, and in preventing slipping.

The unpared sole and frog of the healthy foot need no protection on any kind of soil. The flakes of loose horn on the former serve a very useful purpose in retaining moisture, and so keeping the solid horn beneath soft and elastic, while they act as so many springs when the foot is placed on projecting stones. The more the frog is exposed to wear, the larger and sounder it grows, and the better it is for the foot and limb.

The fore-foot is of more importance, in the matter of shoeing, than the hind one; inasmuch as it has to support much more weight, and is consequently more exposed to disease and injury.

The fore-foot, when well formed, is nearly, if not quite, circular; the hind-foot is somewhat oval, the frog smaller, and the sole more concave. When the hoof is shod the wall is not exposed to wear, and therefore would grow to an indefinite, and, consequently, most inconvenient length, if the shoe should chance to be retained too long, and the excessive growth of horn not removed. The sole and frog, on the contrary, never cause inconvenience, as their growth is limited.

What is required in shoeing, then, in principle, is merely protection from undue wear, with the least possible interference with, or disturbance to, the functions of the foot and limb. The excess in length of the wall must be removed at frequent intervals—between a fortnight and a month—according to the activity of the growth; but the sole and frog, if healthy, should not be disturbed. Not a grain of iron more than is absolutely necessary should be allowed as a protection; and this question of weight of shoes is an important one, especially with horses which are compelled to travel beyond a walk. There are no muscles below the knee and hock, and those which are chiefly concerned in the movements of the limb arise high up, and act upon short levers. An ounce weight at the shoulder or stifle, therefore, progressively and

rapidly increases, until at the foot it has become several pounds. Therefore it is, that a shoe six or twelve ounces heavier than is absolutely necessary to protect the wall from wear, occasions a great waste of muscular power of the limb, and consequent fatigue. If we consider the rapidity with which the weight increases from the shoulder or hip towards the foot, the number of steps a horse takes in a journey of a few hours, and that there are four feet so surcharged, we shall gain some notion of the many needless tons which the animal has been compelled to carry, and the strain thrown upon foot and limb—a strain they were never intended, and are not adapted by nature, to bear. All shoes should, then, be as light as may be compatible with the wear demanded from them.

For all horses except, perhaps, the heaviest animals employed in drays and heavy waggons, the lower or ground face of the shoes should be concave, and the upper or foot surface plane, or nearly so. They should be retained by the smallest number of nails possible—six or seven in the fore-shoes and eight in the hind-shoes. Calks should never be employed for light horses. With the heaviest horses—the dray or waggon animals—it may be advantageous to have toe and heel calks to afford secure foothold.

The procedure in shoeing is simple in the extreme. When the old shoe is removed from the hoof, nothing more is required than to remove the excessive growth of the wall by means of the rasp, applied to the lower margin or ground, or sole border—not the front of the wall. The amount to be removed will depend upon the growth, and of this the farrier's skill in his art should enable him to judge. It is at the toe or front portion that the excess is usually found, and this should be removed until, in an ordinary hoof, when placed on the ground, the angle should be about 50° to 52°. The angle can be easily measured by the experienced eye. The sole or frog should not be touched, not even the loose flakes removed;

and all the work ought to be accomplished by means of the rasp. Paring out and hacking at these parts with the drawing-knife should be absolutely condemned as destructive to the foot.

In reducing the wall to a proper length, care should be exercised in keeping both sides of the hoof of the same height; as, if one is left higher than the other, the foot, fetlock, and, indeed, the whole limb, will be thrown out of the perpendicular. This causes the horse to travel painfully, as it twists the joints, and in time leads to disease. *Nearly always the inside of the foot is left higher than the outside*, and this throws severe strain on the outside of the foot and fetlock. Standing in front of the horse when the foot is on the ground, one can perceive at once whether this deviation is present. In a well-formed foot and leg, a plumb-line should fall from the point of the shoulder through the middle of the knee, shank, pastern, and front of the hoof.

The wall having been reduced sufficiently, the shoe should fit *full* all round the circumference, and project slightly beyond the heels. Heat is not absolutely necessary in fitting it, or procuring accurate co-aptation between it and the hoof. The nails should take a short, thick hold of the wall, so that, if possible, the old nail holes may be obliterated when the excess of horn is removed at the succeeding shoeing. In the fore-foot the nails should be driven home more firmly at the toe than the heels, particularly the inside heel. The clinches must be laid down as smoothly as possible, and with only the most trifling rasping. The front of the hoof or wall should on no account be otherwise touched with the rasp, but ought to pass in a straight line from the top, or coronet, to the shoe. Rasping this part of the hoof is most injurious, and should not be tolerated on any consideration. It removes the dense tough fibres which are best adapted for holding the nails that retain the shoe, and exposes the soft spongy horn beneath; this soon

dries, cracks, and breaks, and does not afford sufficient support to the nails.

The evils of shoeing, as too often practised, are :—1. Paring of the sole and frog; 2. Applying shoes too heavy and of a faulty shape; 3. Employing too many or too large nails; 4. Applying shoes too small, and removing the wall of the hoofs to make the feet fit the shoes; 5. Rasping the front of the hoof.

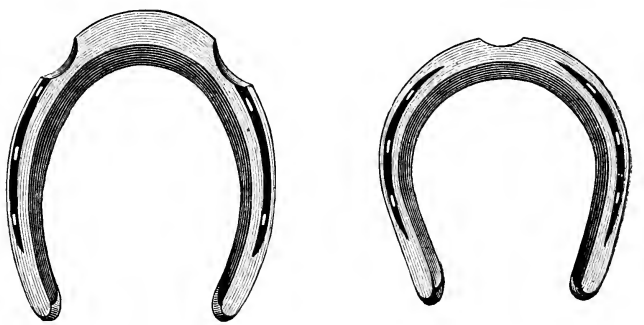
The shoe should give the hoof a level, natural bearing on the ground. Calkings are hurtful to fast-moving horses, and may be dispensed with if the shoes have a concave ground surface, and the frog is allowed to come fully in contact with the ground; if they are resorted to, their injurious effects should be averted by employing a toe-piece of the same height.

For the racehorse, the narrowest iron rim is sufficient, provided it is strong enough not to twist or bend, and to permit a grip of the ground. For hunters, hacks, and harness horses, a shoe of the modified pattern described, and here figured, is well adapted. Even the ordinary fullered hunting pattern, but without the calking on the hind shoe, is infinitely more preferable to that usually employed for hacks and harness horses. For these no better kind of shoe can be recommended than that recently introduced for troop, artillery, and transport horses in Her Majesty's Service. This is, in shape, based on the requirements pointed out, and which it meets in every particular. Since its introduction it has admirably fulfilled all the requirements of a perfect horse-shoe.

Hitherto great difficulty has been experienced in obtaining shoes of good material, uniform shape, and easy application. But the introduction of machinery into horse-shoe manufacture promises to revolutionise the farrier's art. The Horse-shoe and Nail Manufacturing Company, of London,* are now producing

* Offices, 115, Cannon Street, London, E.C.

horse-shoes which, for elegance, durability, and safety, are far superior to anything which has yet been made by hand, and at a much less cost. They are supplying shoes in large quantities, of the pattern we have described and recommended, to the army; and as these shoes are completely finished and ready for immediate application, the time required to shoe a horse is reduced by at least one-half—often a matter of some importance. Not only this, but the shoes can be fitted in a



Hind Foot. Fore Foot.

Pattern of Horse-Shoes in use in the British Army.

cold state, and put on in the stable or anywhere else without the aid of a forge; consequently, sending horses to the farrier's establishment can be dispensed with. These shoes are made of such good iron that they very rarely break; they can easily be altered in shape without heating, and are sold in all sizes.

With regard to nails, all horsemen know how important it is that these should be of the very best quality and shape. The hand-made nails are often very inferior or uncertain in quality, and have to be hammered and pointed by the farrier before they can be driven into the hoof. This hammering and pointing require time, and are not always effected with skill; the surface of the nail is always uneven and ridged, which

makes it more difficult to drive; and not unfrequently the point is too thin or unsound, which, in many cases, causes it to run into the living parts of the foot, or to break, producing serious results. The Globe horse-nail, which is also made by the above Company, is finished ready for immediate use, is perfectly smooth on its surface, strong at the point, and has withstood the most severe tests with regard to tenacity and durability; while, being made by machinery, it is always uniform in size and thickness, and does less harm to the hoof than the hand-made nail. These nails are made to fit exactly all the shoes manufactured by the Company, as well as the special shoes provided for the army horses.

PERIPLANTAR SHOEING.

Knowing that the horse's foot is admirably constructed to perform certain definite functions, and that the hoof, in ordinary conditions, is designed to act as the medium through which the most important of these are carried out, but that its circumference is liable to be broken away and worn when unduly exposed, we have only to substitute for a certain portion of this perishable horn, an equivalent portion of a more durable material, and the hoof is secured from damage by wear, while its natural functions remain unimpaired.

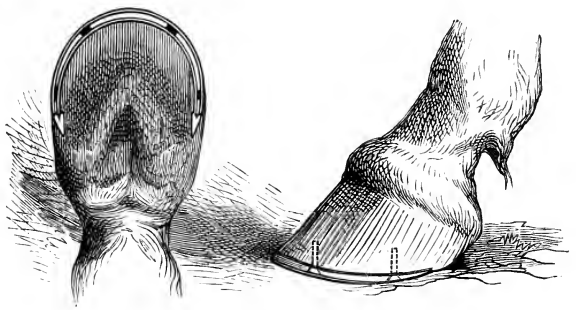
With this object in view, what has been designated the Periplantar or Charlier method of shoeing has been introduced, and with considerable success.

In this method the sole and frog, as well as the bars, are left unpared. The crust or wall is bevelled off at the edge by the rasp, and by means of a special knife, with a movable guide, a groove or recess is made along this bevelled edge to receive the shoe. Into this groove is fitted the shoe. This is a narrow, but somewhat deep, band of iron (or, as now, a mixture of iron and steel; or, better still, *Bessemer steel*). It

is perforated by from four to six oval nail holes of small size, and, if required, may be provided with a clip at the toe, though this is seldom found necessary.

Its upper inner edge is rounded by the file to prevent it pressing too much against the angle of the sole, and the ends of the branches are narrow and bevelled off towards the ground.

The nails are very small, and have a conical head and neck. They must be of the finest quality.



The Sole. Side View.

Periplantar Shoeing.

It is best to fit the shoe in a hot state, as it must have a level bed, and follow exactly the outline of the wall. After it has been fitted, it is desirable to remove, by a small drawing-knife, a little of the horn from the angle of the groove of the hoof, to correspond with the rounded inner edge of the shoe. This ensures the proper amount of space between the latter and the soft horn, at the margin of the pedal bone.

In strong hoofs the shoe is almost entirely buried in the groove ; but in those which have the soles flat or convex, with low heels, or which have been partially ruined by the ordinary method of shoeing, it is not safe to imbed it so deeply, at least to commence with.

SHOEING FOR ICE AND SLIPPERY ROADS.

Provided the frog comes largely in contact with the ground, there is not usually much danger of slipping; but as it is not always possible to secure this, recourse is had to artificial means. Among these are calkins, which, as has been already mentioned, are objectionable in all but slow-paced horses; and indiarubber pads of various forms to fit between the shoe and the hoof, and come in contact with the ground, aiding, as well, in diminishing concussion.

For ice-covered roads there are numerous contrivances. In ordinary "roughing," the shoes are taken off and a sharp calkin is turned up; but this requires a forge, much time, is injurious to the horse's feet, does not last long, and is expensive. "Frost-nails" are sometimes employed, but these also require a farrier, last a very short time, and likewise damage the hoofs. Screw studs or pegs are more convenient, screw holes being made in the shoes when they are first put on, into which sharp or blunt pegs are screwed as occasion may require. But these sometimes break at the neck, or fall out, require to be screwed in, and the thread is liable to become rusty, while they are somewhat expensive. Another much simpler and cheaper method is the introduction of a sharp square peg into a square hole punched in each branch of the shoe, and, if necessary, at the toe—this stud and the hole having a slight taper, which permits the former to be inserted and removed: it should not project beyond the foot surface of the shoe. Or, the studs and holes may be round and tapering in the same manner. Blunt studs may be used when there is not ice, or on wooden pavements, or asphalte. When required to be used, these studs are merely inserted into the holes and require a smart blow; when it is desired to remove them, a few taps on each side, and a blow on the face of the shoe, will generally make them jump out.

This stud method of winter shoeing has been adopted for some years in Her Majesty's household cavalry, and is in use in most of the continental armies.

INJURIES AND DISEASES OF THE FEET.

The foot of the horse, and particularly the fore-foot, is especially liable to disease and injury. Some of the diseases are so serious as to require the utmost skill of the veterinary surgeon; while others are so simple that, though it is always better to obtain skilled assistance, an amateur may yet be able to do something towards curing them, or at least directing a farrier or groom how to proceed in cases of emergency.

Treads.

These are wounds at the top of the hoof in the region of the coronet, and are usually caused by the animal placing one foot on the top of the other when turning round, and especially when weak or fatigued. Of course they vary in severity—from a simple injury which does not produce lameness, to a bruise or lacerated wound which produces great pain and lameness. If not carefully attended to, especially when severe, very serious results may follow.

Treatment.—The wound should be well washed if there is any mud or dirt in it, and then dressed with a little tincture of opium or compound tincture of myrrh; or painting with collodion will form a protective covering. If the wound is lacerated and torn, all the loose parts should be detached, the foot immersed in a warm-water bath or a poultice, and in a few hours afterwards dressed with tow steeped in carbolised oil, and retained by a bandage.

Quittor.

This is usually the result of a tread or other injury to the foot, followed by the formation of abscess, in most instances at

the coronet, towards the quarters or heels, and causing great lameness and the manifestation of much pain on handling it. It is a very serious condition, and requires time, patience, and skill.

Treatment.—If a veterinary surgeon's assistance is not available, the shoe should be taken off and the sole pared, to discover whether the abscess is due to injury there, when an opening should be made so as to allow the matter to escape from below. The horn of the wall should be rasped away from it, so as to relieve the pressure; the foot should then be fomented with warm water for an hour or two, and a large poultice applied. When the abscess opens, the wound may require to be enlarged; but whether or not, a thin pledget of tow steeped in crude carbolic acid should be passed down to the very bottom of it with a probe, every day, until the discharge is completely dried up.

Sand-Crack.

Sand-crack is a split in the wall of the hoof, which may occur at any part; but usually in the front of the hind-foot and the quarter of the fore-foot, and generally the inside one. This crack may occur quite suddenly from severe exertion, aided in some cases by faulty horn secretion. It commences at the top near the coronet, and extends downwards, penetrating to the sensitive parts within, which bleed and are bruised, causing great lameness and intense pain.

Treatment.—When much pain and lameness are present, the shoe should be removed, the horn rasped away at the crack, so as to remove the pressure, and the foot immersed in a bucket of warm water for an hour or so, and afterwards poulticed. If the lameness continues a veterinary surgeon must be called in, and the part well exposed, so as to discover whether matter is forming. When this has been done, it may be necessary to poultice for some days until the inflammation

is subdued, and if any fungous granulations appear, the horn on each side of them must be carefully pared away. The part should now be dressed with tow and Stockholm tar or carbolised oil, retained by a bandage, and when the part is hardened the shoe may be put on, and gentle exercise allowed if there is no lameness; but before the shoe is applied it is better to remove a portion of the lower part of the wall below the sand-crack, so as to relieve it from the pressure of the shoe. In the meantime, some blistering ointment should be rubbed into the coronet; sometimes a notch is made by the hot iron at the top of the crack, and immediately below the coronet; this and the blister expediting a new growth of horn. In some cases the fissure is clamped by special clips or clasps, which are made to grasp the wall on each side. In any case it is well, if the horse is put to work, to have the part protected by tar and tow, retained by a strap or tarred twine, until the sound horn has grown down.

Wounds of the Sole and Frog.

The sole and frog are particularly liable to wounds and bruises from broken glass, sharp stones, nails, or splinters of wood. These will cause lameness and pain in proportion to their severity, wounds of the frog being sometimes accompanied by extensive hæmorrhage, which must be checked by padding with tow, or applying a little muriate of iron. In nearly all these cases the services of a farrier are required to examine the foot, and to pare away the horn from the punctures and wounds, so as to relieve the sensitive parts from pressure when they begin to swell. Immersion of the foot in hot water for some time, and subsequent poulticing may be necessary. Particular care should be taken that no part of the foreign body is allowed to remain in the wound.

Corns.

A corn is really a bruise of the lining membrane covering the bones of the foot, immediately beneath the horny sole, and may occur at any part of this; though it is most frequently observed at the inside heel, in the angle between the frog and the bar, where the sole is thinnest and the pressure is greatest. It is manifested by the blood-stained horn, which is sometimes quite soft and spongy, and increasing in this, on being pared down to the sensitive part. In other cases the stain is yellow and red; and in other cases, again, it is quite superficial, and can be removed. Certain kinds of feet are more predisposed to corns than others, those with weak heels, or very strong ones, being most liable. The kind of work has also something to do with their production, fast pace and hard roads very often causing them; but perhaps the most frequent cause is paring and rasping in shoeing, and faulty shape, or bad application, of the shoe, or allowing the shoe to remain too long on. In slight cases lameness may not be present, and even apparently bad corns do not always produce lameness.

If there is pain when the horse is standing, he usually "points" the foot; and a tap with a hammer on the wall adjoining the seat of the corn will make him wince or exhibit uneasiness.

Treatment.—The prevention of corns largely depends upon a proper method of shoeing; this has already been touched upon. If there is a natural tendency to them, the horse should either be shod with periplantar shoes, with tips, or with three-quarter shoes. In all cases the frog should be allowed to come on the ground, if possible. If there is lameness, the shoe should be removed, and the seat of corn pared out to ascertain the amount of damage; and if there be matter, to allow it to escape. Afterwards foment and poultice until the pain and lameness have disappeared; then apply a shoe which will not

press upon the heel, the kind of shoe depending upon the extent of the injury and the structure of the foot. The danger from a suppurating corn is in the matter burrowing its way up to the coronet and forming a "quittor."

Thrush.

This is a diseased condition of the frog, accompanied by a very offensive discharge from the cleft. It may be brought about by standing in moisture, on foul litter, the absence of pressure to and undue paring of the frog, etc. It is generally an indication of bad hoof management.

Treatment.—Thrush does not often cause lameness, unless there be much disease and sensitiveness of the frog; and frequent dressings with Stockholm tar or carbolic acid spread on tow, which should be pushed into the cleft and crevices, will, in most cases, effect a cure. If there is lameness, fomentations and poultices (charcoal poultices) will be necessary. To prevent thrush, as well as to cure it, the hoof should be kept as dry as possible, the frogs unpared by the farrier, and pressure allowed them by lowering the wall of the hoof as much as may be necessary, and applying thin shoes.

Canker.

This is an advanced degree of "thrush," and is most frequently seen in coarse-bred draught horses. It is entirely due to bad stable or foot management, and is manifested by fungous inflammation of the sensitive membrane of the frog and sole chiefly of the hind feet.

Treatment.—This is a most intractable disease, and requires much skill and patience, so that a cure should not be attempted by an amateur.

Laminitis or Inflammation of the Foot.

This inflammation of the foot, or laminitis, is chiefly confined to the sensitive laminæ, or leaves, which unite the hoof wall to the parts within, and of these leaves those in front are

most seriously affected. These leaves number five or six hundred or more, and surround the front and sides of the pedal bone, the largest and most vascular being in front, and it is these which are involved most acutely. Congestion of these leaves, especially if acute, will produce symptoms like those of inflammation. The causes are: long-continued standing in one position, severe exertion on hard ground, derangement of the stomach or bowels by improper food, or as the result of inflammation of these, or super-purgation; a gross condition and want of exercise, injury to the foot, inflammation of the lungs, improper shoeing, etc. The fore-feet are those most frequently involved, though the hind-feet may also suffer, and in certain cases all the feet may be inflamed.

This is a most painful disease, and causes great suffering, from the fact that the inflamed parts are confined in a rigid horny box, which does not allow of any expansion for the swelling that takes place. The breathing and the pulse are much affected, and the horse shows signs of distress. To relieve the front part of the feet, if the fore ones are involved, the horse throws the fore-limbs forward, so as to place as much of his weight as possible on the heels, with the hind-feet well under the body for support. In this position he will remain fixed, as it were, and it is most difficult to induce him to move. Should the inflammation affect the hind-feet, these are also placed under the body; but the fore ones are thrown back, so as to relieve the latter as much as possible. When attempting to move the animal backwards, the condition of the feet is at once made apparent by the animal's unwillingness to move them, the body swaying back, but the feet remaining fixed to the ground. Attempts to lift one of the feet also cause the animal to evince great agony. In some rare cases the horse is lying down, and then there is great unwillingness to get up. The hoofs are burning hot, and tapping with a hammer or stick greatly increases the pain.

Treatment.—Laminitis is a very serious condition when acute, and may lead not only to serious deformity of the hoof, or its being shed, but even death may result. In congestion, or the less acute form of inflammation, the consequences are not so serious. In the latter it may suffice to take off the shoes, lower the wall of the feet by means of the rasp, so as to allow the sole and frog to bear as much of the weight as possible, and keep them in a tub of warm or cold water for some time, and poultice for a few days. It is a good plan to induce the horse to lie down, or even to throw him down if he will not do so voluntarily.

The floor of the stall or box should be laid with soft bedding or moss litter. Gentle exercise on soft ground should be allowed, as soon as the pain subsides. The diet should be sloppy mashes or gruel, and a mild laxative, such as a pint of linseed-oil, may be necessary. In an acute case, the same treatment has to be followed out, with the addition of an ounce or two of the bicarbonate of soda, two or three times a day, in the food; with scarification of the coronets with the lancet, and the administration of from ten to twenty drops of Fleming's tincture of aconite in a pint of water two or three times, at intervals of four hours. Care is required in working and shoeing the horse for some time after recovery, the soles being kept unpared, and the frogs allowed to come in contact with the ground.

When the inflammation becomes chronic—a very common sequel—the horse's action is more or less altered, the heels coming to the ground in a conspicuous manner, and in the stable the animal has a tendency to rest on the heels. The feet are also generally hotter than in a healthy condition, especially after movement, and they become more or less altered in shape, the soles becoming flatter, the heels deeper, and the front of the wall losing its straight oblique line; there are also characteristic rings, narrow and deep in front, wider

and flatter behind. The feet are also more sensitive when travelling on hard roads, the knees being kept more or less straight. Separation often occurs between the wall, the sole, and the laminæ, leaving a cavity containing powdery horn, and known as "seedy-toe." For this condition, treatment must be chiefly palliative; the horse should stand on tan or moss litter, and for some hours of the day in a stall laid with clay tempered with salt and water, or be allowed to run on moist meadow land. A mild blister may be applied round the coronet now and again, and shoeing be carefully performed.

Seedy-Toe.

We have already referred to the cause of this condition. It may also be due to injury by the clip of the shoe, by driving a nail too near to the quick, or by any other cause which will excite inflammation. Sometimes it may exist without any external indication until the shoe is removed, unless the hoof is tapped, when it will emit a hollow sound immediately over the separation.

Treatment. — This condition, though very objectionable, does not always cause lameness. If a cure is to be attempted, all the separated wall should be removed as far as the white solid horn, every crack or unsoundness being obliterated. A blister should then be applied round the coronet to hasten the secretion of sound horn, and tar and tow bound on the exposed surface until the wall has grown solid and strong.

Navicular Disease.

Navicular disease is, perhaps, the most serious malady to which the foot of the horse is liable. It is confined to the back part of the foot, where the large tendon (perforans) passes over the navicular bone just before its insertion into the sole of the pedal bone. It is most frequent in carriage and riding horses, and is brought on by severe exertion, or

fast pace on hard roads, particularly if the feet are badly shod and the frog is not allowed to reach the ground. In some cases there is supposed to be a natural predisposition to the disease. The fore-feet are, it may be said, exclusively affected.

The feet are, as a rule, contracted at the heels, and hotter than usual. In the stable, or when at rest, the horse "points" the affected foot (*i.e.* he places it forward with the heel slightly raised), as that position gives it relief; if both feet are affected, he rests first one and then the other foot. In movement, unless the disease is very advanced, he may walk sound, or nearly so; it is in trotting, and especially on hard ground, and more particularly with a rider on his back, that he manifests lameness—stepping short, and going more especially on his toes. Because of this manner of going, the shoes are most worn towards the toes. The animal stumbles badly, and goes down hill with much discomfort; after working some time, the lameness passes off to a certain extent. Tapping on the sole, on each side of the frog, will produce pain, and pressure made by the thumb deep in the hollow of the heel will also cause pain and increase the lameness.

Treatment.—Even in the earliest stage, treatment of this disease is seldom satisfactory. The wall of the hoof should be lowered as much as possible, so as to allow the frogs to rest on the ground; and, to this end, periplantar shoeing answers very well. Cold applications (such as poultices) to the feet, or compelling the animal to stand in cold water, a running stream, or in clay tempered with salt and water, may be resorted to. The stall or loose box in which he rests should be laid with peat, tan, or moss litter; and the food should be light, such as green forage, sloppy mashes, etc.

After a week or two of this treatment, a blister should be applied around the coronet, and especially in the hollow of the heel. Turning out on a damp meadow for a month or two may produce very beneficial effects. If the lameness still

persists, however, a seton may be passed through the frog; should this not effect a cure, neurotomy (dividing the nerves of sensation on each side of the leg), by depriving the foot of feeling, will enable the horse to go sound, though it does not cure the disease. In many cases this operation is productive of much benefit, as it relieves the horse from great pain, and allows him to be utilised sometimes for years; care, however, has to be taken by the farrier in shoeing, lest he wound the foot by the nails; and injuries to the foot must also be attended to with more than ordinary care, as the animal does not feel any pain, and therefore does not manifest lameness. It may be mentioned, however, that wounds and injuries heal as rapidly in a foot in this condition as in one which has sensation.

Pricks and Injuries in Shoeing.

In the operation of shoeing, injury is sometimes inflicted by the farrier, either through ignorance, carelessness, or pure accident. Corns have been already alluded to as often due to bad shoeing; but in driving the nails the sensitive part is liable to be damaged by a nail being either driven into it, or so near it as to cause pain and lameness. When the farrier discovers that he has made this mistake, he usually withdraws the nail at the time, and, if he leaves it out altogether, no harm may ensue, provided dirt does not get into the part; if, however, the nail be left in, or grit find admission, inflammation will be set up, which may run on to suppuration, causing much suffering and lameness. The foot will be very hot, and the animal, if standing quiet, continually resting it, or moving it about uneasily, afraid to put his weight upon it. If tapped with a hammer over the spot, or if the sole and wall at the part be pressed upon by pincers, great suffering will be manifested; this is usually the guide to the seat of injury.

Treatment.—Remove the shoe, pare away the sole immediately over the injury, until it is quite thin; make an opening

between the sole and the wall with a small drawing-knife across the track of the nail, so as to relieve pressure, and give exit to any matter which may have formed; then put the foot in a bucket of hot water for an hour or so, afterwards applying a large poultice. When the lameness has gone have the shoe put on again, leaving out the nail at the part which had been injured, and filling up the cavity with tar and tow.

Sometimes in driving back the clip of the shoe against the hoof, this is done improperly, which results in pressing tightly against the wall, and bruising the sensitive parts within. In putting the clip against the hoof, the hammer should be applied at the base first, and then come lightly up to the point. It is the opposite procedure which usually causes damage.

The treatment consists in taking off the shoe, and fomenting the foot in hot water for some time; if need be, a poultice may be applied.

It not unfrequently happens that, with a tender-footed horse, the farrier nails on the shoe too tightly, causing a short and crippled gait, which may not disappear for some days; inflammation may even ensue. The remedy for this is to take off the shoe and put it on more easily, or with smaller nails.

Side-bones.

On each wing of the pedal-bone is a large elastic plate of cartilage, the upper margin of which can be distinctly felt above each side of the hoof towards the heels of the foot, and the use of which is very important in giving springiness to the movements of this part of the limb.

In some horses—and more especially those which are coarse bred—these become rigid or ossified, either through wearing shoes with high calkins or from concussion on hard roads, this change usually taking place in the fore-feet. With slow-paced horses this alteration is not of so much consequence as with riding or harness horses, in which it usually causes lameness.

If it causes lameness the horse generally steps short, and throws his weight more on the front than the back part of the foot; and the condition of the cartilages may be readily detected by pressing them with the fingers immediately above the hoof, when they will be found hard and unyielding.

Treatment.—At the commencement, if inflammation is present and the alteration suspected to be taking place, fomentations and poultices should be employed, followed by blistering, or firing as a last resource, should the lameness not disappear. If this does not effect a cure, then special shoeing must be resorted to, as bar or periplantar shoes, to allow the frog to sustain weight.

CHAPTER XII.

INJURIES, LAMENESS, AND DISEASE.

Every horseman should know something of the injuries, lamenesses, and diseases to which the horse is liable, so that, if he cannot avail himself of skilled advice or assistance, he may be able to render succour to the suffering beast, and direct attendants how to act in ministering to its relief and comfort. It is only too true, unfortunately, that not very much in this direction can be done by book instruction, and least of all with regard to disease; as attempts to impart knowledge of symptoms, and the appropriate treatment, are most likely to prove futile, if not dangerous. Therefore, in this place, no pretence will be made to make every horse-owner a horse doctor, but an endeavour will be made to make him somewhat acquainted with such details as to lameness, common injuries and diseases, as may be useful on emergencies, and especially instruction as to nursing, which, when well performed, is often more than three-parts of the cure of disease. Indeed, if the truth were known, there is too much doctoring and too little nursing of sick animals; and more cases are killed, or their recovery greatly retarded, by pouring drugs into them, than perhaps would die if left alone to the nurse's attentive ministrations. A familiarity with nursing, then, is of more importance to the horseman than amateur doctoring and physicking, which is not unfrequently blundering and deadly.

NURSING.

When a horse is sick or ill from injury, recovery is much accelerated by careful and sympathetic nursing. However

indifferent a horse may be to caressing or kind attention during health, when ill he certainly appreciates them, and when in pain will often apparently endeavour to attract notice and seek relief from those with whom he is acquainted. Therefore it is that kindness and careful nursing will sometimes do more in effecting recovery than drugs and medical attendance. Fresh air and cleanliness, quiet and comfort, are always to be allowed, if possible. The stable or loose box should be warm without being close, and free from draughts. If the weather is cold, and especially if the horse be suffering from disease of the air passages, it may be necessary to maintain the warmth by artificial means, though care should be taken that this does not render the air too dry to breathe. The surface of the body can be kept warm by rugs, and the legs by woollen bandages; yet it must be remembered that a sick horse is easily fatigued and annoyed by too much clothing, and therefore it is better to resort to artificial heating of the stable than to overload the body or impede movement by heavy clothing. If blankets must be used, should the horse have an irritable skin, it is well to place a cotton or linen sheet innermost.

For bedding, long straw should be employed as little as possible, as it hampers movement. Clean old litter, sawdust, or moss litter, are the best. If the hoofs are strong, and the horse likely to be confined for some weeks, it affords relief to take off the shoes. Tying up should be avoided, if possible, unless it is urgently required, the horse being allowed to move about or lie down, as he may prefer.

With regard to food, a sick horse, if the appetite is lost, should be tempted to eat by offering him that which is enticing. It should be given frequently, and in small quantities, but not forced on him; and it often happens that food will be taken if offered from the hand, when it will not be eaten out of the manger. Whether fed out of a bucket or a manger, any that is left should be thrown away, and the receptacle well cleaned

out after each meal. As a rule, during sickness a horse requires laxative food, in order to allay fever or inflammatory symptoms, while supporting the strength. The following list comprises the usual good laxative food employed:—Green grass, green wheat, green oats, green barley, lucerne, carrots, parsnips, gruel, bran mash, linseed and bran mash, boiled barley, linseed tea, hay tea, and linseed-oil. Green grass, lucerne, and similar articles of food, should be dried before being given, if cut when in a wet state. Boiled grain should be cooked with as little water as possible, so that it may be floury and comparatively dry when ready; a little salt should be mixed with it.

One gallon of good *gruel* may be made from a pound of meal, which should be thrown into cold water, set on the fire and stirred till boiling, and afterwards permitted to simmer over a gentle fire till the water is quite thick.

To make a *bran mash*, scald a stable bucket, throw out the water, put in three pounds of bran and one ounce of salt; add two-and-a-half pints of boiling water; stir up well, cover over, and allow the mash to stand for fifteen or twenty minutes until it is well cooked.

Capt. Hayes, in his "Veterinary Notes," says:

"For a *bran and linseed mash,* boil slowly, for two or three hours, one pound of linseed, so as to have about a couple of quarts of thick fluid, to which two pounds of bran and one ounce of salt may be added. The whole should be stirred up, covered over, and allowed to steam, as before described. The thicker the mash, the readier will the horse eat it.

"*Linseed tea* is made by boiling one pound of linseed in a couple of gallons of water, until the grains are quite soft. It may be economically made by using less water to cook the linseed, and afterwards making up the quantity of water to about a gallon and a half.

"*Hay tea* may be prepared by filling a bucket, after scalding it, with good sweet hay, pouring in as much boiling water as

the bucket will hold, covering it over, and allowing it to stand until cold, when the fluid may be strained off and given to the horse. This forms a refreshing drink.

"*Linseed-oil*, in quantities of from one quarter to half a pint daily, may be mixed through the food. It keeps the bowels in a lax condition, has a good effect on the skin and air passages, and is useful as an article of diet."

When debility has to be combated, as in low fever or other weakening diseases, strengthening and easily digested food must be administered; though some of the food already mentioned, such as boiled grain, answers this purpose to a certain extent. Milk, eggs, bread and biscuits, malt liquor, corn, etc., are often prescribed with this object. Milk may be given skimmed or unskimmed; a little sugar may be mixed in it, and one or two gallons of it may be given daily, according to circumstances. One or two eggs may be given beaten up with a little sugar, and mixed with milk, three or four times a day, or more frequently; or they may be boiled hard and powdered, and mixed in the milk. A quart of stout, ale, or porter, may be given two or three times a day, or a half to one bottle of port wine daily. Scalded oats, with a little salt added, are very useful when convalescence is nearly completed.

With regard to *water*, as a rule a sick horse should have as much as he likes to drink, though it may be necessary in certain cases to give a limited quantity, and to have the chill taken off; but it should never be warmer than seventy-five to eighty degrees.

As for *grooming*, as little of this as possible should be allowed when a horse is very weak; and it should be limited to sponging about the mouth, nostrils, eyes, and forehead, with clean water, to which a little vinegar may be added; hand-rub the legs and ears; take off the clothing, and shake or change it once a day; and, if agreeable, rub over the body with a soft cloth.

Exercise, of course, is not required during sickness or injury, and the period at which it is allowed will depend upon circumstances. Care must be taken that it is not ordered too early, or carried too far at first.

ADMINISTERING MEDICINES.

I quote the following from Capt. Hayes' "Veterinary Notes":

"*How to give a ball.*—Much care is required in administering medicines in the form of ball or bolus; and practice, as well as courage and tact, are needed in order to give it without danger to the administrator or to the animal. The ball may be held between the forefingers of the right hand, the tips of the first and fourth being brought together below the second and third, which are placed on the upper side of the ball; the right hand is thus made as small as possible, so as to admit of ready insertion into the mouth. The left hand grasps the horse's tongue, gently pulls it out, and places it on that part of the right side of the lower jaw which is bare of teeth. The right hand carries the ball along, and leaves it at the root of the tongue. The moment the right hand is withdrawn, the tongue is released. This causes the ball to be brought still farther back. The operator then closes the mouth, and looks at the left side of the neck, in order that he may note the passage of the ball down the gullet. Many horses keep a ball in the mouth a considerable time before they will allow it to go down. A mouthful of water or a handful of food will generally make them swallow it readily. If this does not succeed, the horse's nostrils may be grasped by the hand and held a few moments. A running halter should be used, so that the mouth may be quickly and securely closed.

"If the operator has had but limited experience in giving balls, he should station an assistant on the near side, to aid in opening and steadying the mouth, by placing the fingers of his left hand on the lower jaw, and the thumb of the right on the upper jaw. Holding the mouth in this manner facilitates the

giving of the ball, and saves the operator's right hand, to a great extent, from becoming scratched by the horse's back teeth."

A most essential precaution to observe, is to have the ball moderately soft; nothing can be more dangerous than a hard one.

To give a drink or drench.—This requires as much care as giving a ball, in order to avoid choking the horse, though it is unattended with risk to the administrator. An ordinary glass or stone bottle may be used, provided there are no sharp points around the mouth, though the usual drenching horn or a tin vessel with a narrow mouth or spout are safer. When giving the drink it is necessary to raise the horse's head, so that the nose be a little higher than the horizontal line. This may be done, if the horse is quiet, by an assistant; but if he is restless, it is necessary to keep the head elevated by a loop of cord inserted into the mouth over the upper jaw, the prong of a stable fork being passed through it, and the handle steadily held by the assistant. The drink is then to be given by a person standing on the right side (the assistant being in front or on the left side of the horse), the side of the mouth being pulled out a little, to form a sack or funnel, into which the medicine is poured, a little at a time, allowing an interval now and again for the horse to swallow. If any of the fluid gets into the windpipe (which it is likely to do if the head is held too high), coughing will be set up, when the head should be instantly lowered. Neither the tongue or the nostrils should be interfered with.

Powders may be given in a little mash or gruel, well stirred up.

Fomentations or bathing is the application to the skin or feet of warm water. If a wide surface is to be fomented (as the chest, abdomen, or loins), a blanket or other large woollen cloth should be dipped in water as hot as the hand can comfortably bear it, moderately wrung out, and applied to the part, the heat and moisture being retained by covering it with

a waterproof sheet or dry rug. When it has lost some of its heat, it should be removed, dipped in warm water, and again applied. In case of acute inflammation, it may be necessary to have the water a little hotter; and, to avoid the inconvenience of removing the blanket, or the danger of chill when it is removed, the blanket may be secured around the body by skewers or twine, the hot water being poured on the outside of the blanket by any convenient vessel; of course the water should be poured on the top part, so as to allow it to run down. With regard to the feet, these may be placed in a bucket or tub (the latter should have the whole bottom resting on the ground) containing warm water; a quantity of moss litter put in the tub or bucket, so as to make a thick mass, is an excellent mode of fomenting, as it prevents splashing, and retains the heat longer.

Poultices.

Poultices are used for allaying pain, promoting suppuration, softening horn or other tissues, and bringing on a healthy action in wounds. To be beneficial, they should be large, and always kept moist.

"For applying poultices to the feet, a *poultice-shoe*, constructed as follows, may be used with advantage.

"Take a circular piece of hard wood, a little longer and broader than a horse-shoe, and about one and a half inches thick. Get one surface of it rounded in a lathe, so that there may be a rise of about three-quarters of an inch in the centre, while the other surface remains flat. Round the circumference of the board have leather nailed so as to form a convenient boot for retaining the poultice, and similar to the one in ordinary use, except that the part which comes on the ground is rounded. The fact of its being round will enable the horse to whose feet it is applied to ease the affected spot by throwing weight on the toe, the heel, or on either quarter, as he chooses."—Capt. Hayes, in "Veterinary Notes."

Poultices are usually made with bran, though this has the disadvantage of drying very quickly, to remedy which it may be mixed with linseed-meal or with a little linseed-oil. Boiled carrots or turnips mashed up make a good poultice, as does linseed-meal, when mixed with boiling water, and a little olive-oil added by stirring.

A charcoal poultice is sometimes used when there is a bad smell to be got rid of. It is made by adding linseed-meal to boiling water, and stirring until a soft mass is produced; with this some wood-charcoal in powder is mixed, and when ready to be applied some more powder is sprinkled on the surface.

It may be noted that, in lieu of these materials for poultices, the material known as spongio-piline can be usefully employed. A piece of sufficient size is steeped in hot water, applied to the part, covered with a large piece of oiled silk or waterproof stuff, and secured there. Even an ordinary sponge, steeped in hot water, and covered with any waterproof material, makes a good poulticing medium; it is well adapted for the throat, near the head, as well as for the space between the branches of the lower jaw.

Enemas or Clysters.

These are given in fevers, inflammation, constipation, etc., to empty the posterior part of the bowels. They are administered by a large syringe which can contain a quart or more of water, with a nozzle about twelve inches in length, with an ox's bladder tied to a pipe, or a large funnel with a long nozzle at a right angle; but the syringe is best. Water alone is usually employed for enemas; it should be about the temperature of the body, not less, but perhaps a degree or two more. To administer it one of the horse's fore-feet should be held up, while the operator (having filled the instrument, and smeared the end of the nozzle with a little lard or oil) pushes the latter very gently and steadily for a few inches into the intestine,

and then presses out the water. The amount injected will depend upon the size of the animal; from two to three quarts would suffice for an ordinary-sized horse.

DETECTION OF LAMENESS.

Although the majority of people can tell when a horse is very lame by his unequal gait, yet it requires much experience to detect the leg upon which the horse is lame, and especially if the lameness is slight; and still more experience, with a certain amount of anatomical and physiological knowledge, is often needed to discover where the seat of lameness is.

To Capt. Hayes' "Veterinary Notes" I am indebted for the following remarks:

"Percivall defines lameness 'as the manifestation in the act of progression, by one or more of the limbs, of pain or weakness, inability or impediment.' Under this heading we may, for convenience sake, include 'pointing' of the foot, any unnatural position assumed by the horse, and altered action which indicates unsoundness. Irregularity of gait is commonly supposed to constitute lameness, but we may have a lame horse going level when he is equally affected in both fore or in both hind legs. Although deficiency of action is its usual cause, we find that in stringhalt lameness is due to its excess.

"In the examination of a horse for lameness, we should first endeavour to fix upon the affected leg, and then we should try to discover the seat of the disease in that limb. When it pains a horse, whether moving or standing still, to put the natural share of weight on any particular leg, or to bend it, or when he is unable to bend it with freedom, he is then *lame*. Hence to detect lameness we should endeavour to observe any tendency to favour one limb, or disinclination or inability to bend it; or any want of freedom in the gait.

"*Pointing.*—Our first step should be, if possible, to see the

animal in the stable, when he is standing quietly, and free from all excitement. He will then, if sound, often rest one hind-leg by bending its fetlock, while he keeps both fore-legs firmly planted. He will, after a time, ease the other hind-leg, which, in its turn, will be relieved by its fellow, and so on. Although he may stand with one fore-leg slightly advanced before the other, still it will never, unless when diseased, be relieved of its own share of weight, for he will always stand, when on level ground, with equal bearing on both fore-legs. A fatigued horse may rest a near hind and an off fore, or an off hind and a near fore, alternately, without disease. A horse lame in one fore-leg usually stands with his pastern straighter than that of the sound one.

"If we find that the animal points with one foot, while maintaining a position which indicates that he prefers to stand in a constrained attitude rather than put weight on it, we may reasonably suspect that limb.

"As a general rule, when the disease is in the front of the foot, the animal rests his heel on the ground; when towards the heel, he points with the toes and raises the heel. The former is the case with laminitis, and generally in ring-bone; the latter in confirmed navicular disease.

"In almost all cases of pointing, when the disease is not in the foot, the horse keeps the foot flexed, and the heel consequently raised.

"In bad cases of lameness in the hind-leg, the animal often keeps the foot altogether off the ground.

"At the commencement of navicular disease, the horse sometimes points with the heel down, but he soon commences to bring the toe only to the ground, and to 'round' the fetlock joint. In other cases, the patient will stand perfectly firm, although in the great majority of cases the pastern of the lame limb is more upright than that of the sound one, as if he feared to put much weight on it.

"Laminitis is often manifested by the horse frequently shifting his feet when standing.

"The pointing of elbow lameness is characteristic, the fore-arm being extended, the knee in a state of flexion, and the foot perhaps on a level with, or posterior to, its fellow. In severe shoulder lameness, the pointing—if it can be called such—is backwards, the limbs relaxed, knee bent, and the foot posterior to its fellow; sometimes the toe only touches the ground, and the whole limb is semi-pendulous, consequent upon the inability of the muscles to elevate and bring it forward without pain.

"In laminitis, when the disease is in the fore-feet, the horse advances them so as to relieve the toes of pressure; when in the hind-feet, he draws back his fore-feet, and advances his hind-feet with the same object.

"Animals affected with navicular disease often acquire the habit of lying down a great deal in their stalls. Cases of slight lameness behind, such as those of spavin and stringhalt, are often best seen when the horse is pushed over from one side to the other, or when turned round in his stall. We may then observe that the horse shifts the weight on one hind-leg quicker than he does on the other, which we may regard as the unsound limb.

DETECTION OF LAMENESS DURING MOVEMENT.

"Lameness must be very acute for the horse to show it in the walk. As a rule, the slow trot is the best pace at which to observe lameness. The animal should be led in a halter or a snaffle bridle, with plenty of rein, so that the man who leads him may not interfere with the movements of his head. As soon as possible after leaving the stable, the horse should be trotted for inspection on hard ground, which should be free from stone and inequalities. The observer may stand about twenty yards in front of the horse, and on the near side. He

should note, as the animal approaches, whether he 'dwells' in the slightest on one fore-foot more than on the other, and whether he nods his head. If he does either, the observer may conclude that he dwells on the sound limb, and nods his head as it comes to the ground, while the other is the lame leg, which the animal naturally favours by throwing the weight on its fellow. An exception to this is when a horse is very lame on a hind-leg—the near one, for instance; he may then nod his head on the off fore coming to the ground, so that he may throw as much weight in front as possible, which he naturally does to the sound side. When a horse is very lame in front, he may chuck up his head on the lame leg coming to the ground.

"A horse lame in both fore-feet, although he may not drop in his gait, will be short in action—will go, as it has been more forcibly than elegantly expressed, 'like a cat on hot bricks.' Each foot is carefully put on the ground, and quickly lifted up again, while at the same time there is a rolling motion of the body.

"When a horse is suspected of being equally lame on both fore-feet, he should be taken on to soft ground and there slowly trotted. If a marked amendment in the gait is then observed, one may regard the suspicion as confirmed. The time to observe him is when turning. As the chief portion of the weight of the horse's body is borne by his fore-legs, he will not, unless when very lame, dwell on one hind-foot more than the other, but will endeavour to keep the weight off the unsound limb by 'hitching' up its quarter, and consequently keeping it straighter than its fellow. Hence, when the animal has passed the observer, he should take a rear view of the croup, and should mark whether one quarter rises more than the other as their respective feet come to the ground.

"When the horse has trotted past about thirty yards, he should be turned, somewhat sharply, to the right-about, for

instance, while the person who is examining him should note the manner in which he turns on his off hind-leg, so as to be able to compare it with the way he goes to the left-about the next time he turns. In this second trot past, the observer should try to detect if there be any difference in the action of the horse as viewed from the off side, from that which it presented when regarded from the near. If, after two or three trots past, there be still any doubt remaining, perhaps the best way to solve it is to mount the animal and trot him, alternately slowly and rapidly, for a short distance on hard ground, and give him a few moderately sharp turns.

"If we suspect the existence of spavin, we may take up the foot and bend the hock, retaining it in that position for a couple of minutes; if after that the animal trots quite sound, we may consider the joint to be all right.

"In obscure cases of lameness of one leg, we may suspect bone disease—such as incipient ring-bone—as the cause, if the horse stands level in his stall, but trots very lame on hard ground.

"Before putting the horse in, we should try if he backs with freedom and regularity of gait.

"If no lameness be noticed, we may send him back to his stable, and, as a final test, may allow him to stand for a few hours, and then, when he has thoroughly cooled down, try him again. If he passes satisfactorily through the second ordeal, we may, as a rule, regard him to be sound in limb.

"Certain obscure cases of lameness can be detected only during the first few steps the animal takes on quitting his stable, for he may subsequently 'work sound.' Such cases of lameness are usually caused by insidious and serious disease at its early commencement. They are quite beyond the skill possessed by the ordinary amateur.

"Lameness at its first commencement, in the cross-country horse, is often evinced by want of customary freedom and

boldness in fencing; while in the racehorse it is shown by a slight shortening of stride, by unaccustomed ability to 'act' well on hard ground, by his showing an unusual preference for leading with one leg rather than the other, and by his changing his leg oftener than he was wont to do.

PECULIARITIES OF ACTION SIMULATING LAMENESS.

"Some horses, from bad riding or driving, acquire a sort of *hitch* or *lift* in their trot.

"There are some horses which walk down hill in so peculiar a manner that they may be supposed to be lame. This kind of walk has been termed a 'three-cornered walk.' The animal sways from side to side most awkwardly, his hind-quarters being turned to one side or the other, going forwards *broadside on*, similar to an animal going down hill with a heavy load behind him.

"If a sound horse, when trotting, has his head turned towards the man who leads him—going in a sort of 'left shoulder in' fashion—he may appear to be lame on the near fore-leg, on account of stepping shorter with it than with the off fore.

"Some horses, when trotting very fast, appear to go lame behind, by reason of the hind legs not being able to keep time with the fore.

"I have known a horse always go lame in harness, although he went quite sound in saddle, the cause being that, on a previous occasion, when working between the shafts, one of his shoulders became galled, and continuing the work for some time in this state, he acquired the habit of bearing against the collar as much as possible with the other shoulder.

"*Intermittent lameness* is often caused by rheumatism, and may also characterise the early stage of navicular disease.

"*Lameness disappears with exercise*, except, as a rule, in cases

of splints, sore shins, corns, chronic laminitis, inflammation of the coronet (villitis), and sprains.

"A horse suffering from navicular disease goes up hill sounder than he goes down; the reverse is the case in laminitis.

"When the animal is lame behind, the disease is generally in the hock; when in front, in the feet of cart horses, or in the suspensory ligaments of those that are used for fast work.

"When a horse goes lame on a fore-leg without any perceptible cause, and wears away the toe of the shoe, we may suspect that foot of navicular disease. But if he goes on the heel, the probability is that he has either laminitis, 'seedy toe,' or incipient ring-bone. If the lameness be behind, and the toe of the shoe becomes worn, we shall generally find that it is due to spavin.

"Side-bones are almost peculiar to cart horses, sore shins to race-horses, and navicular disease to riding, cab, and carriage horses. Navicular disease and occult spavin are hardly ever found in horses under seven years of age."

WOUNDS.

Every one who keeps a horse soon finds out that this animal is liable to many wounds and injuries; every part of the body may be wounded. If the wound is clean cut, and there are no foreign matters about it, an attempt should be made to heal it by "adhesion" or the "first intention"—that is, to unite the divided edges at once. The parts should, therefore, be brought together without delay; and to do this the injury must be treated while fresh, as if not done very soon it will be useless. Sometimes the object in view—to bring the divided edges into apposition—may be accomplished by means of a bandage, smoothly but rather firmly applied; but more frequently it can best be done by sutures. To insert these, it is nearly always found necessary to keep the horse quiet by

"twitching," to prevent injury to the operator and attendants. There is nothing cruel in twitching a horse, if it be properly and humanely done, and if pressure only be put on the imprisoned part of the upper lip, when the animal shows signs of resistance. Sutures may be inserted in many different ways to bring the divided edges of wounds together; but for the more professional operator, what is called the "interrupted suture" is most convenient and efficient. This is made by passing a pin through both edges of the divided skin, half an inch deep or more, according to circumstances, and then putting a piece of twine or tow over the point and head in the form of a figure 8 "close hitch," or round and round, so draw the edges of the skin together, and tie moderately tight; or instead of pins, a needle armed with twine, thread, or wire, may be used, and passed through both edges of the skin, as above described, and the ends tied together, the superfluous pieces being cut off. Suture wire has the advantage of not irritating the skin so much as twine or thread, and, besides, it cannot absorb irritating and acrid discharges or other matter.

When the wound is too long to be closed by one pin or suture, several may be employed. If pins are used, each may be fastened separately with twine, in the manner just described, or one piece of twine may be twisted round all of them in figure-of-8 fashion, so as to make them support each other. When wounds are lacerated and torn, it is of little use—except in certain cases—to bring the divided edges together by sutures, as such lesions will not close, except by a gradual growth from the bottom and sides, called "healing by granulation." In this event, care must be taken that no cup or pouch is left for pus or matter to collect in the parts: but we must have what is called a "dependent orifice," so that all discharges can drain away as they form; otherwise they are apt to burrow amongst the tissues and under the skin, and so form deep-seated and troublesome abscesses and sinuses. Attention to this dependent

orifice is a most important point in the treatment of wounds. If matter is collecting, exit *must* be given by puncturing at the lowest part, so that it may readily escape, and do no further harm.

We must not forget, when we are treating a wound, to consider whether any foreign body is concealed in it—such as pieces of wood, iron, thorns, or splinters, or other objects, such as we frequently find in cases occurring to hunting-horses. If such foreign bodies are not extracted, the wound will rarely heal, and we then have much loss of time and aggravation of the original injury. We may here remark that wounds of the horse show a much greater liability to suppurate than obtains in mankind, where there is a greater tendency to heal by adhesion or the "first intention."

Overreaches are wounds of the heels of the fore-feet, caused usually by the inner edge of the toe of the hind shoe. For this reason the inner edge of the hind shoe of hunters is, by a farrier who knows his business, bevelled so that no sharp surface is left. If this is not done, the shoe cuts like a knife if by any accident the hind-foot reaches the fore-heel, and a lip of horn, with the soft part to which it is attached, is cut down, forming in many cases a troublesome and annoying sore. To treat this, the detached horn should be cut off, so as to leave no harbour for dirt or gravel, and the part should be well washed and dressed with tar or other medicament, and then bandaged up with tow, when a cure is generally soon effected. In treating overreaches, it is necessary to thin the horn below the wound, so as to allow it to expand to the swelling which naturally occurs in the injured parts. If this be not done, much irritation is often caused to the patient, and the cure is retarded.

Bleeding or Hæmorrhage.—If the injured vessel is small, the bleeding will usually stop of itself; but if large, a remedy is often required. Sometimes pressure will do this, or plugging

the wound with tow or soft material. An instance of arresting hæmorrhage by pinning up the cut in the skin is observed after bleeding a horse in the jugular vein running down the neck. Sometimes bleeding from a large artery may be stopped by the pressure of the finger; a *tourniquet* may be improvised until further assistance arrives. In the case of wounded arteries, ligatures are sometimes necessary, or the vessels may be twisted on themselves until their channel is obliterated.

The particular method of stopping bleeding must be determined by the circumstances of the case. Cold water will often stop bleeding from small vessels. Hæmorrhage from an artery may be known by the red colour of the blood, and by its spurting out in jets, in unison with the beat of the pulse. In hæmorrhage from a vein the blood does not jerk out, but runs in a continuous stream, and is darker in colour than that from an artery.

Dressing for Wounds.—It is now believed that there are germs of disease floating about in the atmosphere, which are apt to settle on wounds, and cause unhealthy action in them. For this reason we apply dressings; and very good ones are carbolic acid, one part to forty of water, or carbolised oil, one part of the acid to twenty or thirty of olive-oil. Sometimes wounds are very indolent, and in such cases sharper and more stimulating dressings are required, such as lotion of sulphate of zinc and water, or mild caustic solutions, or even painting them with nitrate of silver or butyr of antimony. Of course, this must not be overdone or too frequently. When proud-flesh forms, we should not be in too great a hurry to remove it, as it will often disappear spontaneously; but should it not do so, no time should be lost in excising it, or destroying it by caustics. In reference to the latter, we may remember that where there is much fungous or proud-flesh, time is often lost by employing caustics, when it could be at once removed by a cut with a razor or sharp knife.

Punctured Wounds.—These are of various kinds. When a punctured wound is deep, and does not very soon heal, but shows that it is irritated by the occurrence of swelling and pain, the external orifice must be enlarged by a cut, and kept open, so as to afford exit to any imprisoned matter. Of course, if a joint is injured, the great object is to close it as soon as possible; therefore, in such cases no cutting is required.

Sometimes the eye-lid of the horse is torn, and hangs down, being only attached at one end. This should not be cut off, but an attempt made to preserve it. The raw edges, if it is not attended to immediately, should be made to bleed all over by careful paring with a sharp knife or fine scissors, and the divided parts, having been carefully adjusted, should be united by pin, or thread, or wire sutures. An astonishing cure, without any blemish, is thus very often effected, and the patient is saved from the life-long annoyance caused by the loss of so important a protection to the visual organ as an eye-lid.

The lips should also, when wounded, be treated in the same conservative manner; of course, the animal must be kept quiet by a twitch while the sutures are inserted; and afterwards he should be so fastened that he cannot rub the parts against the manger, rack, or sides of the stall or box in which he may be confined.

BROKEN KNEES.

Broken knees are of frequent occurrence, and are a very great annoyance and trouble, not only in themselves, but also because the blemish may materially lessen the horse's value when he is to be sold. They very often arise from the horse falling while trotting down hill, and most frequently when he is being ridden by a servant or groom; and for this

reason some horse-owners are always in the habit of strictly forbidding the trotting of any of their riding horses down hill while they are out at exercise. If the accident is slight, and one or both knees may have been merely "grazed," and only a portion of hair removed, and, in addition, there may be a little abrasion of the skin—in such cases sponging well with warm water will often be the only remedy required. In other cases the skin is cut through, and the tissues underneath may be exposed, and more or less wounded. Here, unless the injury is superficial, the advisability of getting the horse into a stable as soon as possible must be considered. If the knee is deeply cut, it is obvious that the patient had better not walk farther than is absolutely necessary. In such a case, when the horse has reached a stable, the parts should be gently fomented, and, if need be, veterinary assistance should be sought without delay; in the meantime care being taken to keep the injured limb as quiet as possible, and the animal free from anything disturbing or exciting. If the knee joint is opened, the case is serious, and the leg cannot be kept too still after bandaging with a little tow and some dressing, such as carbolised oil or carbolic lotion. It may be found judicious to turn the horse round in the stall, and keep him on pillar reins, to prevent him from knocking or rubbing the injured limb against the manger; and, if he attempts to bite the wounds, a "cradle" should be placed on his neck. In very severe cases, "slinging" the patient will be found a very great advantage. In some cases, when laceration or contusion is superficial, and freed from dirt or grit, a favourable result will be obtained by spreading some Canada balsam on a piece of lint, and applying it to the part, leaving it there until it drops off.

Cases of broken knees vary so much that only general principles of treatment can be here given, and great professional experience is required to treat all but simple cases.

SORE BACKS.

Sore backs may be considered under the head of wounds, and occur even in the best managed stable; but careful attention to the fitting and stuffing of saddles will—at least, for civilian purposes—almost always prevent them. Sometimes, however, they occur from the roller or surcingle pad having become too flat, thus letting it press down on the spinous processes of the vertebræ. In such cases, a large and troublesome sore is formed. Whenever, therefore, a sore is seen on the spine where the roller pad crosses it, the latter should receive attention. As to the treatment of sore back, if there be a swelling without abrasion of the skin, it should be fomented or poulticed. If the skin is abraded, it should be fomented, and then dressed with a little oil to keep it soft. Sometimes what is called a "sitfast" forms, this being a portion of dead leathery skin firmly fixed by the roots to the subjacent supports. It is hard and painful to the touch, and the quickest remedy is to cut it out with a knife and forceps, when it becomes a simple wound; it will heal rapidly when kept soft with vaseline or oil. Sometimes the pummel of the saddle presses on the withers, causing a fluctuating tumour, often the size of a walnut or small orange. These enlargements frequently contain serous fluid, which remains a long time, unless exit be given to it by puncturing with a knife or lancet. If the horse is ridden with one of these enlargements still pressed upon by the saddle, it increases in size, and becomes very painful; and at last an abscess forms and bursts, and we may have that very stubborn and obstinate disease, "fistulous withers," to deal with, one which taxes the greatest skill of the experienced veterinary surgeon. This shows how necessary it is not to neglect saddle galls of the withers, but to remove the cause at once, and attend to the injury.

Girth galls usually only require to be fomented and kept

clean, and get rapidly well. But before the saddle is again used it should be attended to by the saddler.

Injuries by harness should be treated in the same manner, alum and water, or salt and water, being sponged over the skin, to make it hard if it is tender. For tender skin from saddle or harness, ordinary writing ink has been used with good effect.

FRACTURES.

A *simple* fracture is when the bone alone is broken, without protrusion through the skin; *compound* fracture when the bone pierces the skin; *comminuted* when the bone is broken into many pieces; and *complicated* when other tissues than the bone are also injured.

Very many—in fact, most fractures are treated under great disadvantages in the horse, as he cannot be induced to keep the injured parts still; and he will, therefore, often destroy the reparative work of months by a few moments of struggling or restlessness. One of the most common fractures is that of the *point of the hip*, and it is often caused by knocking that bone against the door or gate-post while going too hastily past it, or by falls or other accidents. In this fracture the affected hip (when we view it from behind the animal) is flatter than the sound one, and, when newly done, the broken bone can be easily felt. It is, as a rule, curable, so far as the horse becoming sound goes; the fractured parts either unite or the fragment becomes encysted, and does not cause lameness. A horse with a broken point of the hip is called "hip-down." It is a fault too often overlooked by purchasers, and it is, of course, an unsoundness. When such a fracture has recently occurred, the horse should be kept in a stall, as quiet as possible, for six weeks or two months, when the parts have either united or the detached fragment become encysted, as above explained.

Fractures of individual bones are numerous and serious. An experienced veterinary surgeon should always be consulted.

SPRAINS.

Sprains may be classed as injuries; and a very common one is that of the ligaments or tendons of the fore-leg.

Tendons and ligaments are formed of strong fibres; and when some of these are unduly stretched and broken, inflammation sets in, and we have heat, pain, and more or less swelling, according to the severity of the injury. If pressure be applied to the swelling, the horse shows pain, but so he will if it arises from a blow or a kick; therefore, such swellings should not be too hastily called sprains; and the owner of the animal would do well to wait a day or two before coming to a decision. If the swelling arises from a blow, the pain will soon begin to disappear, and the enlargement to diminish. Sometimes the swelling "pits" on pressure of the fingers, and by this symptom an experienced veterinary surgeon can almost always give a correct opinion.

There is a ligament which arises from the back of the knee, and is inserted into the flexor tendon, called the "perforans," about half way between the knee and fetlock. This ligament, named the "metacarpal," is strong, and may be said to brace up the leg, and greatly help it to bear the violent strain it is continually sustaining during rapid progression. This metacarpal ligament is often sprained, and the symptoms are a painful swelling and lameness. There is also another painful ligament arising behind the lower part of the knee, called the "great suspensory ligament." It runs down behind the cannon bone, and just above the fetlock it bifurcates or divides into two branches, each of which is attached to the sesamoid bone on its own side, and then continues downwards and forwards until it reaches the front of the pastern, where it becomes

attached to the expanded tendon of a muscle called the extensor of the foot. The suspensory ligament is liable to sprain, and the symptoms are swelling and lameness.

Treatment.—The treatment of these sprains varies. Of course, in all sprains it is essential to keep the affected limb as still and quiet as possible; and therefore owners of horses, who, in their impatience, take the animal out of his stable every two or three days to see how he is getting on, are acting very injudiciously. The treatment should begin by the application of cold water, by means of a loose linen bandage frequently wetted. This bandage should be removed altogether at night, because, the groom being then absent from the stable, it would soon become dry, and only irritate and heat the injured parts. It is not necessary to take the bandage off to wet it. The limb should be put into a bucketful of water, which ought then to be "slopped" on the bandage for a few seconds. If this be done frequently during the day by the groom while he is about the stable, the bandage will be kept sufficiently wet and cool. Some people prefer diligent fomentations for sprains, and there is much to be said in favour of their views. Whether fomentations or cold applications have been adopted, the swelling usually becomes gradually less inflamed, and the pain diminishes. After about a fortnight, it is generally necessary, unless the inflammation still continues, to consider the propriety of applying a strong blister to the part. When this has been done, it is advisable that it be not oiled, or have any greasy or emollient substance applied to it for at least three weeks, and that the crusts should on no account be washed off, or any part of the scurf removed. More haste is worse speed here; and for the blister to have fair play, its results should not be meddled with, at the least under three weeks. Sometimes, in sprains of the flexor tendons and ligaments of the leg, a high-heeled shoe is beneficially applied to take strain and pressure off the parts. It should

not be forgotten that a horse thrown out of work and exercise for sprain and lameness, should have light diet. Bran-mashes should be given for the first few days instead of oats, and afterwards half bran-mash and half oats mixed should be allowed—of course, with the addition of hay or grass. If blistering for sprains is not successful, firing may be tried; and it often succeeds when all other remedies have failed.

The foregoing may be called the general principles of treatment for sprains, and they can be applied according to the varying circumstances of each particular case. There are sprains of the flexor tendons and ligaments of the hind-legs, as well as those of the fore; and also sprains of tendons and muscles in different parts of the body, which it is beyond the scope of this book to describe.

BRUISES.

The best treatment for bruises is, as a general rule, frequent fomentations for at least half an hour at a time, and this remedy is usually successful. Some mild stimulating liniment may, after a time, be applied, to remove any obstinate remaining swelling.

The eye is sometimes injured, the part most frequently suffering being the outer transparent coat, called the cornea. Sometimes this is injured by the rider carelessly striking the horse about the head; or it may be injured against trees or other objects. When the cornea has been injured, the eyelids are nearly or quite closed. On opening them, the cornea is probably found to be abraded, and perhaps more or less of a milky whiteness. This is very apt to alarm the inexperienced owner, as it seems unlikely that so much opacity would ever clear away; yet it often will, in a very astonishing manner. Fomentations are the best treatment here, and many recommend that a wet cloth should be placed over the eye, to keep

out the light. Sometimes the opacity will, to a certain extent, disappear; but at one point it obstinately remains, and looks as if it would never be removed. Nor will it unless treatment be resorted to, in the form of applying something very stimulating to the part, in the shape of nitrate of silver or other strong remedy. Of course, this should only be done after all inflammation has quite disappeared, and when all progress has ceased.

An amateur, however, cannot be recommended to employ such remedies on his own account; they should only be used by an experienced veterinary surgeon, and the effects require careful watching. Suffice it here to say that, even in long-standing cases of partial opacity of the cornea, the treatment above described is often attended by marked success.

DISEASES.

Colic.

This is a very common disease of the digestive organs, and is due to improper food, very cold water, sudden change of diet, exhaustion from over-work and fasting, and then repletion, and many other causes. The pain is usually sudden; the horse paws, kicks at his belly, looks round with a longing, uneasy expression at his flanks, lies down, and rolls on his back, or lies outstretched; then, suddenly rising, he shakes himself, and is free from pain for a short time until another spasm comes on.

If due to indigestion, colic is best treated with purgative medicines and enemas. In slight attacks, a draught composed of a stimulant combined with an opiate (nitric ether and tincture of opium) generally effect a cure. Sometimes three or four ounces of alcohol given in a quart of tepid water, will answer equally well.

Inflammation of the Bowels.

This is a very serious disease, and often kills in a few hours. The ordinary causes are exposure to cold, over-fatigue, washing with very cold water when the horse is heated, and not properly clothed afterwards; indigestion, strangulation of intestines, and colic, will also produce it.

The first symptoms are manifestation of abdominal pain, though these are generally preceded by shivering, quick breathing, dulness, and repeated evacuations of small quantities of fæces. The appetite is lost, and the pulse quick and hard; as the pain increases, the animal becomes restless, paws, rolls about in a cautious manner, the body becomes covered with perspiration, the nostrils are widely distended; he wanders excitedly or listlessly around the box; the eyes grow wild and haggard; there is sometimes a groan or a scream of pain; the gait is staggering, and at last the animal falls and dies, after a few convulsive struggles.

Opiates must be administered in large doses, in order to arrest the pain, and check as much as possible the movements of the intestines. One or two ounces of tincture of opium, or two or three drachms of opium powder in water, may be given, followed by smaller doses at intervals; or one ounce of extract of belladonna in water may be administered. Hot fomentations should be applied to the abdomen for an hour at a time, and enemas of warm water given gently, but not too frequently; if these increase the pain, they must be stopped.

Diarrhœa.

This is a term applied to all simple purging in which the fæces are liquid. It may be a natural effort to discharge from the bowels anything obnoxious to them, or to the system generally.

Horses that are not well "ribbed-up," and those of a nervous temperament, are particularly prone to diarrhœa; they are difficult to keep in condition, but will sometimes do very well if kept on good food and at slow work. When nervousness is the cause in hunters, allowing them only a small quantity of water before going out answers in many cases.

If due to indigestion or some irritant, a mild aperient, such as a dose of linseed-oil, will often effect a cure. In all cases the diet should be changed. For acute cases a mild astringent, as prepared chalk combined with opium, will be necessary; and if there is much weakness, stimulants should be administered. Catechu is a good astringent. Oil of turpentine and opium, beaten up with eggs, has been found very useful in many cases.

Irregular Teeth.

When the back or molar teeth become irregular, sharp, and chipped, they cut the cheeks or the sides of the tongue, and prevent the horse masticating his food properly; this imperfect mastication leads to what is called "quidding," the horse dropping pellets of half-masticated hay from his mouth. There is also usually loss of condition and unthriftiness.

The teeth will require careful examination to ascertain their condition. The mouth requires to be kept open by a gag balling-iron, and a particular-shaped rasp is employed to file down the sharp teeth.

Worms.

Several kinds of worms infest the horse's intestines, but the most common is a long, white, round worm, tapering at each end. When a large number of this worm is present the horse loses condition, and has a harsh, rough skin, which clings closely to the ribs; the appetite is sometimes voracious, and not unfrequently the abdomen is distended.

There is another kind—a small thread-like worm, about an

inch in length, which infests the rectum, near the tail, and causes intolerable itching: the horse is continually rubbing his tail and hind-quarters against anything with which he can come in contact.

For the larger worms, any tonic medicine, such as powdered gentian, sulphate of iron, sulphate of copper, etc., will generally suffice to weaken or kill them, when they may be removed by a dose of physic. It has been recommended to give the horse, in his food every day for a week, one-and-a-half drachm sulphate of iron and tartar emetic, and then administer a purgative, the diet meanwhile being bran and hay.

For the smaller worms, an enema of salt and water will very often suffice; or, after an ordinary enema has been given to clear out the intestine, another enema, composed of a quart of linseed-oil, in which six ounces of oil of turpentine have been mixed, should be administered. To prevent the invasion of worms, it is a good plan to allow a little salt in the food, or have a piece of rock salt always in the manger.

Indigestion.

Indigestion is due to several causes, and is most frequently observed in old horses. It often arises from over-feeding, or from indigestible food, and often accompanies debility.

The treatment will depend upon the cause; this should be removed. As a rule, an oil or aloetic purgative is the first step to be taken, to be followed by tonics. When the indigestion is chronic, frequent small doses of bicarbonate of soda do good.

Diuresis or Profuse Staling.

This condition often occurs when horses are supplied with bad forage, as mow-burnt or mouldy hay, or kiln-dried oats. It may also be due to giving too much diuretic medicine, as nitrate of potass, turpentine, etc. What are called "condition

powders" produce it sometimes, and cantharides blisters have been known to act in this way, from the cantharidine becoming absorbed and acting on the kidneys.

The treatment will depend upon the cause. Clay mixed in the water given to drink is often of great service. The administration of a little laxative medicine, as linseed-oil, or small doses of calomel, is all that is necessary in some cases. A drachm or two of iodide of potassium mixed in linseed-tea is another remedy, with tonics, such as sulphate of iron, if there is debility. A drachm of iodine given in bolus has been vaunted as a specific.

Megrims.

Megrims is a disturbed condition of the circulation of blood in the brain, which causes the horse to show signs of giddiness or stupor. This is usually manifested when the horse is at work, generally only a short time, and especially when the pace is fast, particularly in harness. The horse commences to shake his head, as if something had got into his ears; then he becomes unsteady in his gait, carries his head high, and, if not immediately stopped, will stagger about and fall. When on the ground he will lie a few minutes quite still, then get up, look stupefied and depressed, shake himself, and gradually regain his ordinary condition. From the fact that the attack usually comes on when the horse is driving in harness, it may be due to a badly-fitting bridle or collar, or a tight bearing-rein. It may also be due to over-feeding, or being put to work too soon after a hearty meal. But in many cases it is doubtless due to a diseased condition of the brain.

The treatment here, again, must depend upon the cause, which should, if possible, be removed. When it is due to a diseased brain, the horse should either be disposed of or destroyed, as dangerous accidents may arise when working him. When the horse is about to have an attack—shown by

shaking and jerking about the head—he ought to be stopped at once, and some one placed at his head until he is calm. If he falls, the throat-strap should be unbuckled, the collar eased off the lower part of the neck, and cold water dashed on the head.

Epilepsy.

This is a convulsive disease, arising from a disordered condition of the brain and spinal cord. It comes on suddenly, when the horse is out of doors, or even in the stable. The face, neck, and limbs, are seized with convulsions when the animal is standing; the eyelids wink, and the eyes roll about, the jaws champ, and the poor creature presents a pitiable spectacle. When he falls the convulsions continue, the limbs are plunged about, and the jaws are so fiercely moved that the tongue is often badly lacerated by the teeth; sometimes the animal moans or screams.

There is no remedy for this disease, and in the great majority of cases the horse should be destroyed, as it is dangerous to work him. If he falls during the attack, the head should be held down on the ground, to prevent it being damaged during the struggles. Cold water may be dashed on the face, and the mouth washed out with it. Great attention should be paid to the diet.

Fainting.

This may be due to exhaustion after severe exertion, to a weak or diseased condition of the heart, or as the result of a debilitating disease. There are usually no premonitory signs, the horse falling, and lying perfectly still and unconscious, the breathing being perhaps slower than natural, and the pulse weak and small. An indication that the animal is unconscious is in the tongue not being retracted when it is drawn out of the mouth.

To promote recovery, sponge out the mouth with cold

water, and allow the animal to swallow some, if he can. If possible, place the head down hill, or on a lower level than the body. Hand-rub the legs and ears well, after removing the bridle and slackening the girths. When the horse can swallow, give a stimulant, which may be one or two wine-glassfuls of spirit in a quart of water, or a quart of old ale warmed, with some powdered ginger added. When the horse gets up the surface of the body should be well rubbed, wisped, and dried.

Cold or Catarrh.

This is one of the most common diseases of the horse, and which may be said to be due in nearly every case to bad stable management, or bad stables. There is nasal discharge, often fever and cough, with more or less languidity and weakness.

In this condition, the chief treatment consists in careful nursing. A comfortable, well-ventilated stable or loose-box, and clothing the body and legs ; moist and warm food, without much corn, are all that is necessary, except it be a little nitrate of potass in the water. If there is constipation, one or two ounces of sulphate of magnesia may be given at intervals, and its action may be supplemented by an enema of tepid water. If the cough is troublesome, stimulating liniment, mustard or its extract, may be applied to the throat. If the breathing becomes quickened, the cough more severe, fever increased, and appetite diminished, a veterinary surgeon should be sent for, as inflammation of the lungs, bronchitis, or pleurisy, is to be apprehended.

Congestion of the Lungs.

Acute congestion of the lungs is a serious condition, and is often seen in horses called upon to do severe fast work when not properly prepared, and especially when brought into hot stables. Indeed, over-heated and badly-ventilated stables are a common cause of congestion of the lungs. Horses in high

condition, or plethoric, are also liable to attacks. Debility may also bring it on, and it is often an accompaniment or sequel of a cold, or exposure to severe weather. If not quickly relieved, the horse will die, or the congestion will pass on to inflammation of the lungs.

The horse breathes hurriedly, the nostrils being widely dilated, and the face anxious; the head and neck are extended, and the front limbs wide apart, all the limbs being icy cold, and patches of perspiration on the body.

An abundance of fresh air should be allowed; the legs should be well hand-rubbed and bandaged, and the body warmly clothed. It may be necessary to apply mustard to the sides of the chest; mild stimulants, as small doses of brandy, should be given frequently. But a veterinary surgeon should see the horse as soon as possible, as complications may arise, and delay is dangerous.

Broken Wind.

This is indicated by difficult expiration, most marked at the flank, where the gradual rise there is interrupted by a momentary check, and then resumed with a kind of jerk. Inspiration is performed with ease and steadiness. There is generally a short, hollow, characteristic cough.

Medical treatment is not of much avail in "broken wind," but relief can be afforded by attention to feeding and watering. The horse should be fed in small quantities, and frequently, and water ought to be given in the same way.

Surfeit.

Many diseases of the skin pass by this name, though the most common is perhaps nettle-rash, which appears suddenly as an eruption of hard lumps, or weals, on different parts of the body; itching is also present, and the hair often falls off. In a few days the symptoms disappear.

This condition is usually brought about by derangement of the stomach, or it may be due to exposure to a hot sun, cold wind, standing in draughts when over-heated, or from the horse drinking cold water when hot.

The treatment will depend upon the cause. If surfeit arises from indigestion, a mild dose of physic with sloppy diet, with an ounce or two of bicarbonate of soda once or twice a day in it, will effect a cure. If the eruption becomes chronic, tonic medicines should be given. The body should be well clothed.

A constitutional form of surfeit is sometimes seen, and is very troublesome. Little blisters form on the body, which burst and crust over; and at the same time there is great itching, causing the horse to rub and bite himself.

Great attention should be paid to the diet, which should be more or less laxative, and nitrate of potass should be frequently given. Liquor arsenicalis is useful mixed with the food—about an ounce daily. Lead lotions to the skin allay the itching, or even ordinary vinegar (one part to twenty of water) will have the same effect. A linen sheet worn beneath the woollen one is advantageous.

Mange.

This is a contagious disease, due to a minute insect, and presenting symptoms not unlike the last.

Active treatment is necessary for the destruction of the parasite. Paraffin oil, applied once a day, and allowed to dry on the skin, is very efficacious, as is also a mixture of sulphur and common oil, well rubbed into the skin; or oil of tar and sulphur, of each two ounces to a pint of common oil. McDougall's sheep-dip, also Jeyes' fluid, may be used advantageously. The skin should be washed with soap and water before the dressing is applied, and it should be washed again in a day or two after the dressing. Clothing and

harness should be thoroughly cleansed, and care should be taken to keep the affected horse from healthy ones.

Ring-worm.

This is a disease due to a microscopical vegetable fungus, which, commencing to grow in the hair follicles or roots, destroys the hairs, and makes bare circular patches of varying size, with scales or scurf upon them. There is but little itching, though the inflammation set up may cause soreness. The disease is very contagious and disfiguring, and, if not treated in time, may be very intractable. Young horses are more susceptible to it than old ones. Before the bare patches appear, when the hand is passed over the skin, little rough spots can be felt, and the hair can be seen to stand erect over these.

Treatment.—If there are only isolated patches, these may be treated by rubbing in a little Stockholm tar or iodine ointment; if the disease be more diffused over the skin, then the treatment as for mange should be adopted.

Grease.

Grease is a diseased condition of the skin of the pasterns, due to inflammation of the oil glands at this part, the secretion of which is greatly increased (hence the name) with, as it advances, cracks and ulcers, and accompanied by pain and lameness, and swelling of the legs. This condition is, in nearly every case, due to bad stable management, and very rarely to digestive derangement.

Treatment.—Fomentations and poultices to subdue the inflammation, afterwards dressing with carbolised oil, will generally effect a cure in mild cases; citrine ointment, or oxide of zinc ointment, is also very useful.

Cracked Heels.

This may be said, in the majority of cases, to be a form of grease, though generally it may be unaccompanied by any

increase of the oily secretion of the skin. The hollow of the pasterns is the part where the cracks usually occur, and the tendency of this part to become affected is greatly increased by trimming the heels, and exposing the skin to cold and damp; sometimes it may be due to derangement of the stomach. Cracked heels are much more common in cold, wet weather, and especially if the horse is working on muddy, chalky, or sandy ground; also if the legs and feet are washed with cold water and not thoroughly dried. There are great pain and lameness, the horse going on the toes, the cracks in the skin discharging a watery fluid, and even bleeding when the horse is moving. When the pastern is handled the horse jerks up his leg, which often becomes swollen above the fetlock. It is customary in big towns, during the winter, when the roads are slippery, to melt the ice on the track of tramways by sprinkling salt; this, mixing with the mud, produces a very acrid compound, which is particularly active in producing cracked heels, and even sloughing of the skin.

Treatment.—In very mild cases a little oxide of zinc ointment, or carbolised oil, may be rubbed into the skin once or twice a day; if the skin is broken it should be thoroughly cleansed by washing with soap and water before applying these. Should the inflammation be rather intense, and the lameness great, after washing, a linseed-meal poultice should be applied for a day or two, when the dressing may be used. Should the cracks show a tendency to become chronic, they may be touched with nitrate of silver or pure carbolic acid, after which the ointment or carbolised oil may be applied; pledgets of tow, smeared with these, may be tied round the pastern. In very bad cases, the application of a high-heeled shoe will greatly expedite recovery. To prevent cracked heels, a little vaseline or lard rubbed into the hollows of the pasterns, and around the coronets, is very useful. To prevent injury from salted roads, white lead, made into a thin paste with

common oil, is an excellent application when smeared around the pasterns. These parts should not be deprived of the hair, nor yet washed in cold water, but the mud should be removed with a wisp of straw when the horse returns to his stable.

Mud Fever.

This is the same condition of the skin of the other parts of the limb as cracked heels, and is due to the same cause, or causes, the inflammation extending to the under parts of the belly. The skin is hot and painful (it may be even swollen), and the hair on it is erect, while, when the hand is passed over it, a roughness or eruption can be felt; if not checked the hair will fall off, sores appear on the skin, and much stiffness or lameness, with a certain amount of fever, will be present.

Treatment.—This consists in applying to the inflamed skin Goulard's extract (one part) and olive-oil or glycerine (four parts), or veterinary vaseline. If fever is present, give sloppy diet and a mild dose of physic. To prevent mud fever, the body and legs should not be washed when the horse returns to the stable, the dirt being removed by scraping and rubbing with a straw wisp. If there are draughts in the stable—or, indeed, under any circumstances—it is well to apply woollen bandages as high as possible on the limbs. When quite dry, the remainder of the dirt may be removed by the brush, or by a damp sponge and a soft cloth. If the legs must be washed, then this should be done in the stable, and the skin quickly and thoroughly dried and hand-rubbed, some vaseline being afterwards applied, and then flannel bandages. As a preventive, the legs should not be clipped.

Warts.

These grow on different parts of the skin, and are sometimes very troublesome when they are situated where the

harness rubs them; they are frequently of such a size or formation as to constitute a disfigurement. They may be removed by caustics, ligature, the knife, or the hot iron. As a rule, it is better to employ the veterinary surgeon to remove them, especially if they have a wide base, and require the knife.

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